The Grill: Futurist and inventor Ray Kurzweil foresees computers embedded in clothing, with airborne virtual displays, in the next 10 years. PAGE 26

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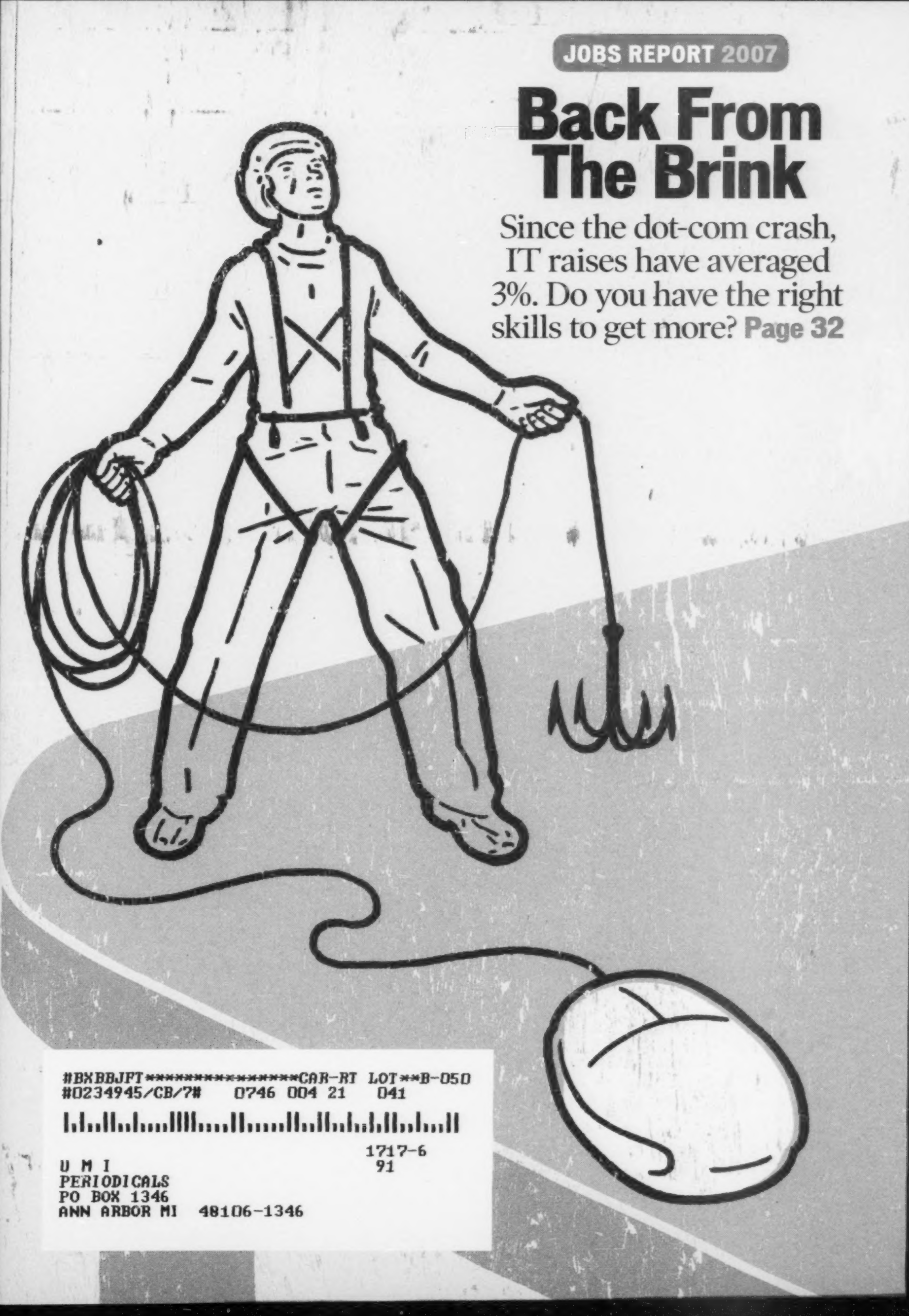

JOBS REPORT 2007

Back From The Brink

Since the dot-com crash, IT raises have averaged 3%. Do you have the right skills to get more? **Page 32**

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Inside

NOVEMBER 12, 2007
VOL. 41, NO. 46 $5/COPY

News Analysis

New federal financial incentives for using e-health systems may not be enough to win over doctors. PAGE 18

Whole Foods takes a hard line on online postings by its top executives. PAGE 22

On the Mark: Virtual machines are great, but will they create a network bottleneck? PAGE 24

Opinions

Apple's Leopard OS lays the foundation for the next generation of personal computing. PAGE 30

Frankly Speaking: Google's new phone software will change the game – even if it loses. PAGE 72

Careers

Yes, a master's degree really can boost your IT paycheck. PAGE 66

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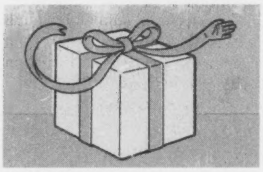
JOBS REPORT 2007

Back From The Brink

After a big tumble in 2002, IT salaries have been climbing steadily. But for IT workers trying to regain their financial footing, a string of 3% increases makes the going tough. Stories begin on page 32.



Are You the Complete Package?

48 IT executives say they're increasingly looking for staffers who have solid business acumen and soft skills, like communication and listening abilities, in addition to technical chops. Here are nine nontechie skills that hiring managers wish you had (with advice about how to get them).

A Lopsided Pay Scale

54 Salary inequity between men and women in IT might be a long-standing problem, but it could have short-term consequences for companies that choose to pay female IT professionals less.

Speedy Hires

56 With an IT talent shortage looming, here are some tips for speeding up the hiring process. Suggestions include developing thorough job descriptions and doing research to determine realistic salary ranges before you start interviewing candidates.

Tech for Teens

58 The next generation of workers is being lured to the technology field with skills development programs like the week-long Teen Tech Camps in Memphis, sponsored in part by the Society for Information Management.

Tech Campuses Bustle With Recruiters

60 A report shows that starting salaries are up, and university officials say IT recruiters are flocking to campuses. But mid-career IT workers had better beware.

ONLINE

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Check our online interactive tool for compensation data for more than 50 IT titles. Our 2007 survey reports on salaries from more than 9,000 IT workers.
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CHARTS AND DATA

40 Find salary information for 30 IT job titles, plus data by region and industry. Also, read the results from a survey of IT managers about the skills they want most in their new hires.

OPINIONS

52 How can employees get the jobs they want, and employers get the workers they want? **Jim Lanzalotto**, of recruiting firm Yoh, offers some action items for both camps.

62 With business growth and technology investments driving demand, IT workers have a significant advantage in the job market. Robert Half Technology's **Katherine Spencer Lee** explains how to capitalize on it.

COVER AND ILLUSTRATIONS ABOVE BY DAN PAGE

■ NEWS DIGEST

12 NaviSite's data center move knocks **165,000 sites** offline. | A **problem-driver registry** is fingered for **security flaws**.

14 Microsoft **fires its CIO** for violating company **policies**. | **Phishers** prey on **Salesforce.com** users after an employee falls for a **scam**.

16 The **U.S. Marines** turn to **virtualization** for deployments of "mobile platforms" for the battlefield.

■ NEWS ANALYSIS

18 Feds Prescribe More Money for E-health Push. But the new incentives for using EHRs may not be enough to spur widespread adoption.

22 Whole Foods Handcuffs Execs on Web Postings. The grocer curbs blogging after its CEO's anonymous comments cause a furor.

■ OPINION

6 Editor's Note: Don Tennant thinks the dismissiveness female IT pros face is linked to the pay disparity between women and men in IT.

30 Michael Gartenberg finds Apple's Leopard OS to be stable and full of productivity enhancements.

72 Frankly Speaking: Frank Hayes sees potential in the "GooglePhone," even if it's not a market winner.

■ DEPARTMENTS

24 On the Mark: Virtual machines are a boon to systems administrators, but they can bust your network, too, observes **Mark Hall**.

26 The Grill: Inventor **Ray Kurzweil** talks about really pervasive computing, augmented reality, and storage as a philosophical issue.

66 Career Watch: Computer science at the University of Denver; what a difference a degree makes; and what makes workaholics tick.

70 Shark Tank: A newly hired IT business process manager soon learns what happens if the incident management system goes down.

■ ALSO IN THIS ISSUE

Letters	**8**
Online Chatter	**10**
Company Index	**70**

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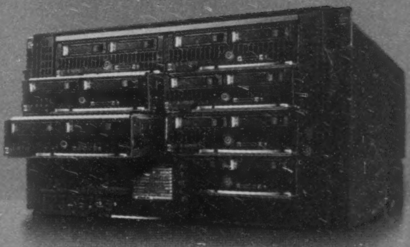

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This Week Online

Google

Google's Mobile Phone Platform May Lead to Market Fragmentation

Android is intended to be an open operating system for mobile devices, but analysts say it could lead to market fragmentation and may threaten incumbent carriers and other vendors in the mobile market. computerworld.com/mobilewireless

Making the Google Phone, OpenSocial Connection

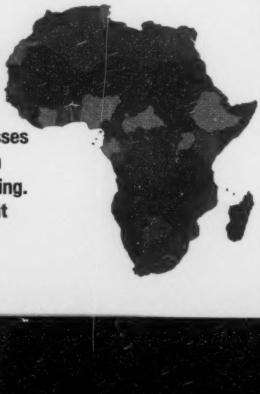
OPINION: News about Google's OpenSocial initiative and speculation about the "GooglePhone" are interesting enough on their own, but more interesting still is how these two major projects are connected. computerworld.com/mobilewireless

10 Career-Killers to Avoid

Like other workers, IT pros can unintentionally sabotage their careers. John M. McKee, president of BusinessSuccess-Coach.net, talks about how to recognize and avoid trouble. computerworld.com/careers

Leopard Server vs. Windows Server

OPINION: It's true that Windows is more full-featured than Leopard in some areas, particularly when it comes to networking management for large companies. But in most cases, Leopard is still the better server operating system, says Ryan Faas. computerworld.com/servers



Africa: Outsourcing's Next Frontier

Q&A: Vidia Mooneegan, managing director of Ceridian Mauritius, discusses the emerging growth opportunities in Africa for business process outsourcing. computerworld.com/itmanagement

Clearing Up Confusion On Vista Licensing And Key Management

Jonathan Hassell explains five key points about the Byzantine rules of managing Vista on or off the network. computerworld.com/networking

Windows Vista

Nanotech Will Replace Disk Drives In 10 Years, Researcher Predicts

Michael Kozicki, a researcher at Arizona State University, is developing ways to store data in nanowires instead of as electrons in cells. This, he says, will lead to dramatic advances in storage – as well as dramatic differences in the way we use mobile devices, laptops and servers. computerworld.com/storage

Blog Spotlight

Sparring Over Women in IT

Don Tennant wasn't impressed with a vendor's decision to use scantily clad "ring girls" to lure IT professionals to its booth at a Gartner show. But he does give the vendor credit for its direct response to his concerns. computerworld.com/blogs/node/6494

The Gaming World Meets The Corporate World

Ian Lamont asks you to take a look around your workplace and count the people who are under the age of 40. At many offices, there are probably a lot. Meet Generation G, the under-40s who belong to the video game generation. computerworld.com/blogs/node/6478

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Outside the Job Description

As you climb the corporate ladder, flexibility is a must. But one IT professional thought the demands on his department had gone a bit far when he found himself being asked to set mousetraps. http://sharkbait.computerworld.com/?q=node/1826

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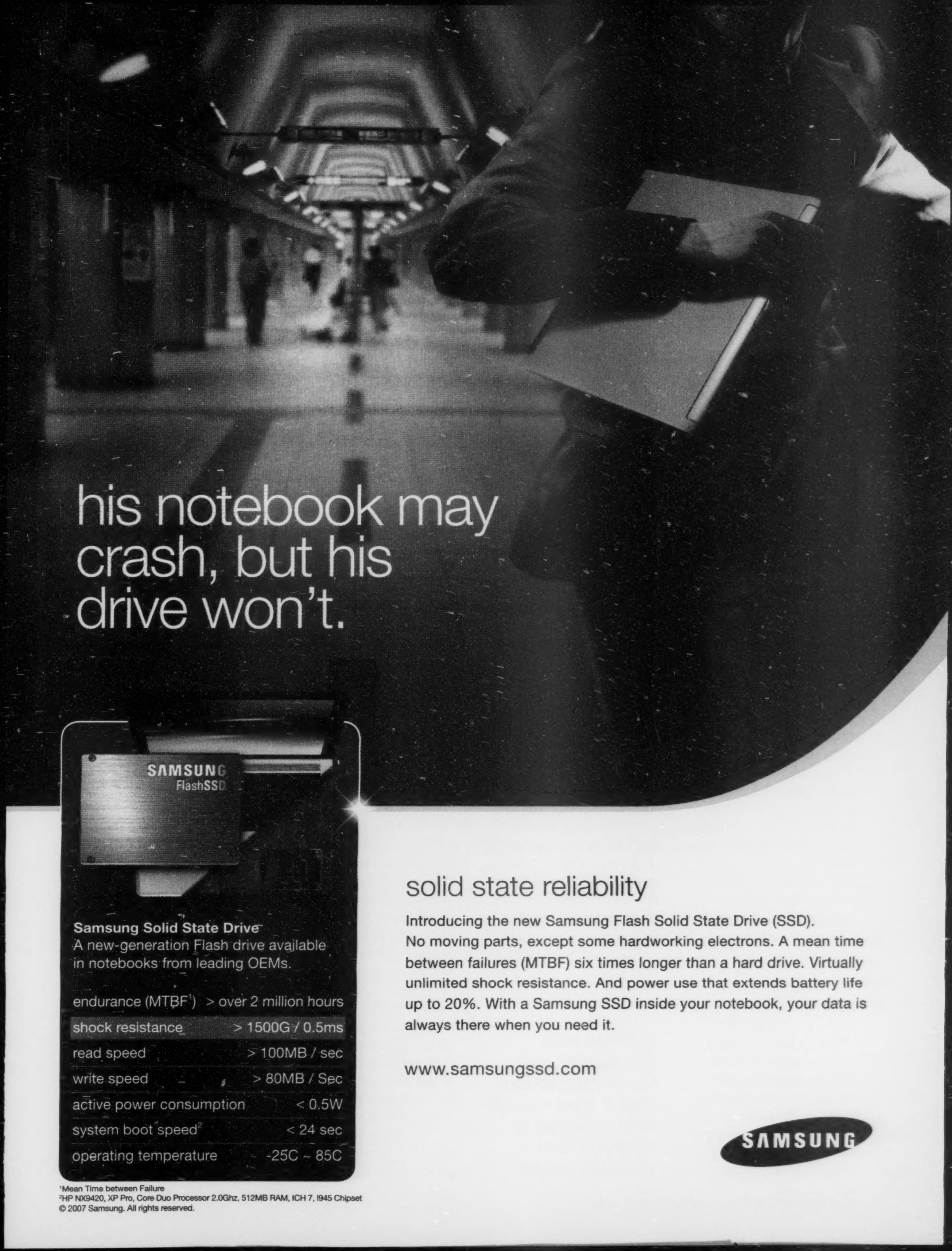

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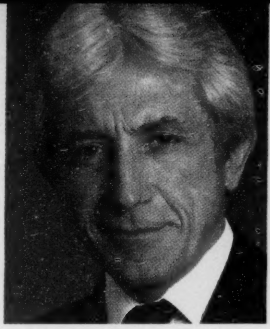
EDITOR'S NOTE

Don Tennant

Getting Old, Indeed



LAST WEEK'S column struck a chord with a lot of readers, but not the one I thought it would. When I wrote about the embarrassing practice of using women as eye candy being revived at last month's Gartner Symposium/ITXpo 2007, I thought most readers would respond by condemning the practice as an affront to female IT professionals. I was wrong.

The majority of readers who responded to the column had no problem with the fact that Vanco, a U.K. network service provider, featured two scantily clad "ring girls" in its boxing-themed display at the opening reception of the Gartner event. When I took issue with the incident and suggested that it warranted a reaction of outrage among IT professionals, I got an earful from readers who faulted me for making a big deal about it and taking political correctness to an extreme.

"If you do not like a promotion then do not visit the booth. Let's keep a little perspective, please," one reader advised. "Get over it," echoed another. "And stop with this political correctness nonsense. It's getting very old."

What I found especially interesting was that some readers suggested that I was making a connection between the behavior of the two women and the degradation of the female IT professionals in attendance.

"The two women were behaving immodestly," one reader wrote. "To say the behavior of a few reflects on the larger group is absurd and only applies to the weak-minded or foolish." Another reader disagreed with my contention that the women were being used.

"No, we're talking about women being PAID. There's a difference," he wrote. "The 'ring girl' models knew exactly what they were doing, and are about the last persons who need or deserve sympathy in this situation. . . . Any female CIO who felt 'degraded' or 'demeaned' by this vendor exhibit was simply reacting stupidly."

Now, let me be clear: I was in no way judging the behavior of the two women, nor was I suggesting that their behavior warranted sympathy. I'm confident that they were both over 18, and they had every right to make the choice to work as models at the event. Indeed, they were being paid. But make no mistake: They were also being used. That the vast majority of readers who responded to the column are oblivious to or dismissive of how they were being used is the problem.

■ What was demeaning was the presumption that it was acceptable to adopt a strategy that targeted males.

Vanco used the women to attract the crowd's attention to its booth. And the mind-set behind the planning and execution of that strategy was that the target crowd would be attracted by provocatively dressed women. The targets were males.

The fact that the two women made the choice they did isn't what was demeaning to the female IT professionals at the event. What was demeaning was the presumption that it was acceptable to adopt a strategy that targeted males. The fact that so many people can't see that, or can see it but have no problem with it, explains a lot.

For one thing, it helps to explain the phenomenon that was once again documented by our annual IT salary survey: Women are paid less than men for doing the same work. As we show in this week's Jobs Report 2007, the average total compensation for men in 2007 was $91,460, up 3.8% from last year. For women, it was $83,510, up 3.5% from last year. The fact that that 9% disparity is down from last year's 12% figure is little consolation if you're on the short end of the stick.

When I've written about this topic in the past, I've made it clear that I recognize that the numbers aren't weighted to account for factors such as family considerations. Such factors compel women to steer away from making potentially career-enhancing changes such as relocating, so dollar-for-dollar comparisons don't tell the whole story.

But neither do the career-restricting decisions that some women make. To suggest otherwise is as absurd as the overt dismissiveness that female IT professionals all too often encounter. And to borrow the words of one of my correspondents, it's getting very old. ■

Don Tennant *is editorial director of* Computerworld *and* InfoWorld. *Contact him at don_tennant@computerworld.com.*

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■ LETTERS

The Pros and Cons of Removing Online Posts

I do not believe that either comment removed from the story "Data Centers Get Religion" was off topic ["Under the Covers," Editor's Note, Oct. 15]. Instead, I believe that the title was worded to offend seriously religious people, whether Christian or of another faith.

The removal is censorship of the natural language of religious people. Secular persons may prefer that spiritual discussions avoid personalization. But the language of people of faith is by nature personal. Christians do not see Christianity as a theory. We see it as an all-encompassing personal experience with each other and with a living God. We see prayer as the avenue that God uses to effect change for a better society. Our view of a better society may conflict with the secularist view. But our view and our language should not be censored.
■ **George Wade,** *Web developer, Battle Creek, Mich.*

With that headline, you opened up the rat's nest of religion. It might have seemed to be a cute headline, but not everyone in the IS world is keen on individuals who, in their opinion, take shots at something near and dear to them. As a Christian, I am not offended by the article or the title. But if you open the door, you'd better be ready for what walks in, and if you and your paper are defenders of the First Amendment, you'd better take the good and the bad and even the off topic as the situation warrants.
■ **Jeffrey Romeo,** *information services specialist, Salem, Ore.*

I support the decision to remove the posts. I happened to read the story early enough to see the responses that were later removed. At the time, I thought they were inappropriate. After the removal, I read the new comment and thought, "If you had said it that way the first time, the post wouldn't have been removed." You have a clearly stated set of guidelines that prohibit off-topic and inflammatory posting, and I, for one, am pleased that your editorial staff chose to enforce it.
■ **Wesley Jolly,** *owner, Audio Visual Installations of Virginia, Virginia Beach*

As a bivocational pastor, I work a full-time job in the IT industry and serve as an associate pastor at my church. Based on what you said in your editorial, I can completely understand and support your decision to remove both of the posts, because they do indeed seem to be off topic. As long as the rules are consistently and fairly enforced, I can find no fault in your logic.
■ **Matt Goben,** *senior developer/analyst, Kansas City, Mo.*

Woe is he the binder of the human tongue; a pox upon on the house of one that stifles written expression . . . er, wait a minute. You are the editor in chief, the proverbial police of prose. Is it not your mandate to pare to the pith that which meanders textually? You acted within your jurisdiction. I'm just sorry I was subjected to the offending post after the fact. Your readership is drawn to your site by its computer-orientated content. There has to be a Zealotworld.com out there for those of such an inclination.
■ **Roland Ketchley,** *Bellingham, Wash.*

I believe you have made an error in judgment. Not in deleting the two posts, but in second-guessing that decision.

I understand the occasional desire to ask, "Was this the right decision?" In this case, I'm afraid you will get an undecipherable collection of responses. I'd guess you will hear from zealots of every type and opinion. While it breaks down to yes or no, I really doubt the responses will be that clear-cut.
■ **Lex Rutter,** *public safety communications chief, Meridian, Idaho*

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RESPONSES TO:

Ethics in IT

Oct. 29, 2007

It is not Bryan's responsibility to make sure this person is fired or prosecuted; that is the responsibility of other people. His job is to notify management. If the management, FBI, prosecutor, judge, or anyone else in the chain decides to let this illegal activity go on, then it will, and there is nothing Bryan can do to stop it. Had he gone to the FBI, then the company would have fired him, and then tried to cover up the whole thing, and this person still would have gotten away with it. Have no regrets, you did the right thing.

■ **Submitted by:** *Dave*

A situation close to home had my immediate manager in contravention of clearly stated corporate policy. Everyone knew it; everyone said it was wrong; but no one could or would do anything about it (I tried by going to HR, but their hands were tied). This was the corporate culture, as it was his boss that okay'd this policy exception and he also had oversight for the policies. How do you overcome this? For 7 years we didn't, but just recently the CEO left and a new one came on board. Everything happened very quickly after this. My boss's boss was given the "leave or get fired" option, which cleared the way for my boss to be fired. Things have improved marginally, but the real payoff will be longer term if the current corporate culture becomes more attuned to the value of its own policies.

■ **Submitted by:** *Sheeva*

Ethics, like their cousin, principles, are nice to have — provided you can afford them.

■ **Submitted by:** *Quinn the Eskimo*

RESPONSES TO:

No More Optimism

Oct. 29, 2007

TJX's experience is a good argument against instant breach notifications. It's taken them almost a year of digging to find the root cause and ultimate depth of the breach. However, no PR person who wants to stay employed, nor any company reliant on the public trust, is going to say, "Hey, we had a breach, we have no idea how bad it is and we won't until we complete a thorough investigation. Could take a long time, so we'll keep you informed as we have news." But anyone in IT knows that's the real answer.

Unless your company has made a large investment in log management, investigations take time, effort and digging. Even with the data centralized, it can be hard to figure out which entries need more review. Unfortunately, since the current trend is to do breach notifications with little time for adequate forensics, the TJX example is simply the most obvious example of what we can expect to see more of.

■ **Submitted by:** *Anonymous*

To be honest, I just love what happened to TJX, because it allows me to use them as a great example of what happens when security best practices aren't followed. Can you think of a better example to highlight the dangers of lack of compliance, lack of policy (or is it policy enforcement?), lack of effective IT security, lack of forensically sound logs, intrusion detection, etc.?

So thanks, TJX, you're making my job easier — at least by providing a great example of what not to do!

■ **Submitted by:** *Chris*

RESPONSES TO:

No More Mr. Nice Guy

Oct. 29, 2007

Unfortunately, my career of 35 years presented all the scenarios presented in this article. At one time, minimal politics and IT managers with backbone existed, but FUD has blown away those solid principles of good management in the IT department. It is not rocket science to understand why computer science degrees are on a downslide. Bring back good IT management, and you will regain the leadership we once had in the IT global arena!

■ **Submitted by:** *L. Wical*

The world is awash in software. If software were oil, it would be two dollars a barrel. The problem is IT is still making everyone wait in line for solutions like it was the '70s. End users should have the freedom to use the plethora of solutions available via the SaaS model and live or die by their decisions. Usually they will make the right ones because IT is no longer the domain of a privileged few. IT is mainstream. Stop the IT malaise and breathe the fresh air of open-market software adoption.

■ **Submitted by:** *Anonymous*

When the different departments partner together, then you have success. But too often you have to guess what the other one wants. Not because they are hiding something from you, but they do not know either. How do you expand the use of improved services when the other party is clueless on what they really want?

One responder mentioned SaaS as a solution. That is well and good if you really have SaaS defined so that they can build it like Legos. Too many of us have the special parts of Legos and not enough of the common blocks that are required to put all those special parts to use. Transforming the data from one interface to another can result in too much overhead.

■ **Submitted by:** *Henry S3*

RESPONSE TO:

Phishers Nearly Pull Off $10M Scam of Grocer

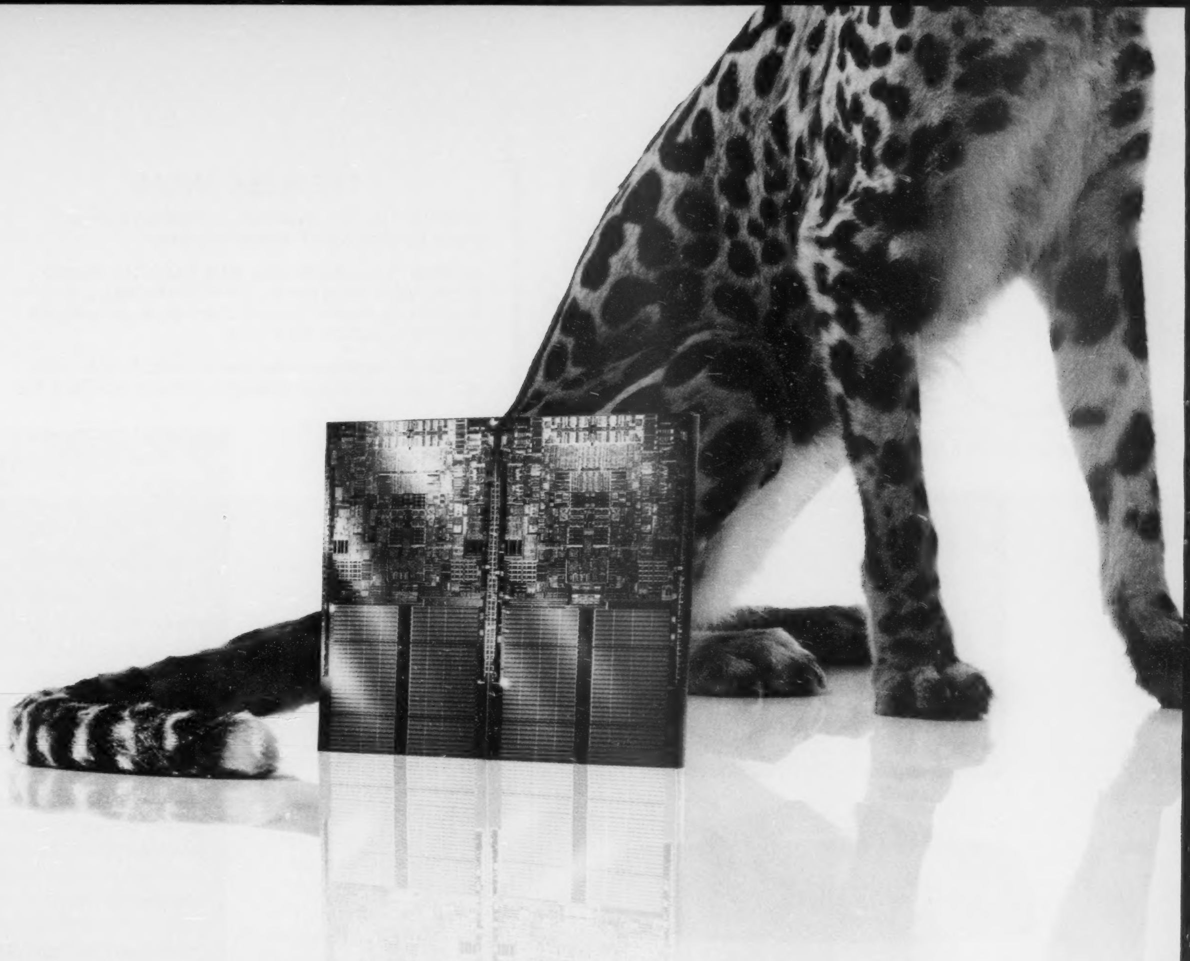
Oct. 29, 2007

"Due to our internal controls and processes, we were able to quickly discover and report this to the FBI."

Too bad they didn't have an internal control and process that said "Don't blindly obey random e-mails."

■ **Submitted by:** *Anonymous*

JOIN THE CHATTER! *You, too, can comment directly on our stories, at* **computerworld.com**.



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News Digest

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THE WEEK AHEAD

MONDAY: The main conference proceedings begin at Oracle OpenWorld 2007 in San Francisco.

MONDAY: A four-day meeting of the Internet Governance Forum, which was created by the United Nations, gets under way in Rio de Janeiro. Scheduled discussion topics include cybercrime, security and privacy.

TUESDAY: Keynote sessions start and exhibits open at the SC07 high-performance computing conference in Reno, Nev.

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ISTOCKPHOTO

INTERNET

Botched Data Center Move Takes Out 165k Web Sites

A CASCADING SERIES of problems with a data center consolidation project at Web hosting company NaviSite Inc. left about 165,000 Web sites offline last week, with some of the sites remaining unreachable for six or more days.

The problems began on Nov. 3, when NaviSite tried to shift processing done on 850 servers at a data center in Baltimore to its headquarters in Andover, Mass. NaviSite acquired the Baltimore facility in August, when it bought Alabanza Corp., another hosting vendor.

Rathin Sinha, NaviSite's chief marketing officer, said the company decided to move 200 of the 850 servers to Andover and migrate the data from the rest of the systems to new machines at the Massachusetts data center.

NaviSite told affected customers that their sites would be down for less than a day. But Sinha said that when the company attempted to transfer the data from the 650 servers still in Baltimore, it encountered synchronization failures that kept mushrooming.

Company officials then decided to transfer another 200 servers to Andover to help reduce the scope of the virtual migration and speed up the data transfers.

But NaviSite ran into more problems. As the host servers finally started coming up, URLs didn't work, and customers were able to access their Web sites only by using the underlying IP addresses, Sinha said.

Then, he added, NaviSite's network became overloaded because of all the customers trying to get online, further exacerbating the situation.

On Thursday, NaviSite said that 90% of the Web sites were back online. The next morning, the company said it was "down to a final set of [trouble] tickets."

But the length of the outages prompted some NaviSite clients to vow in forum postings that they would switch to other hosting vendors once they could retrieve their data.

Others threatened class-action lawsuits, and New York-based law firm Wolf Popper LLP confirmed that it was looking into possible legal action after being contacted by NaviSite clients.

Cynthia Brumfield, president of Washington-based Emerging Media Dynamics Inc., wrote in a blog posting that the data center consolidation was "poorly planned" and had "slipped from mere incompetence to outrageous indifference" to the needs of companies like hers.

— Linda Rosencrance

PRIVACY

Problem-Driver DB Ticketed for Security Flaws

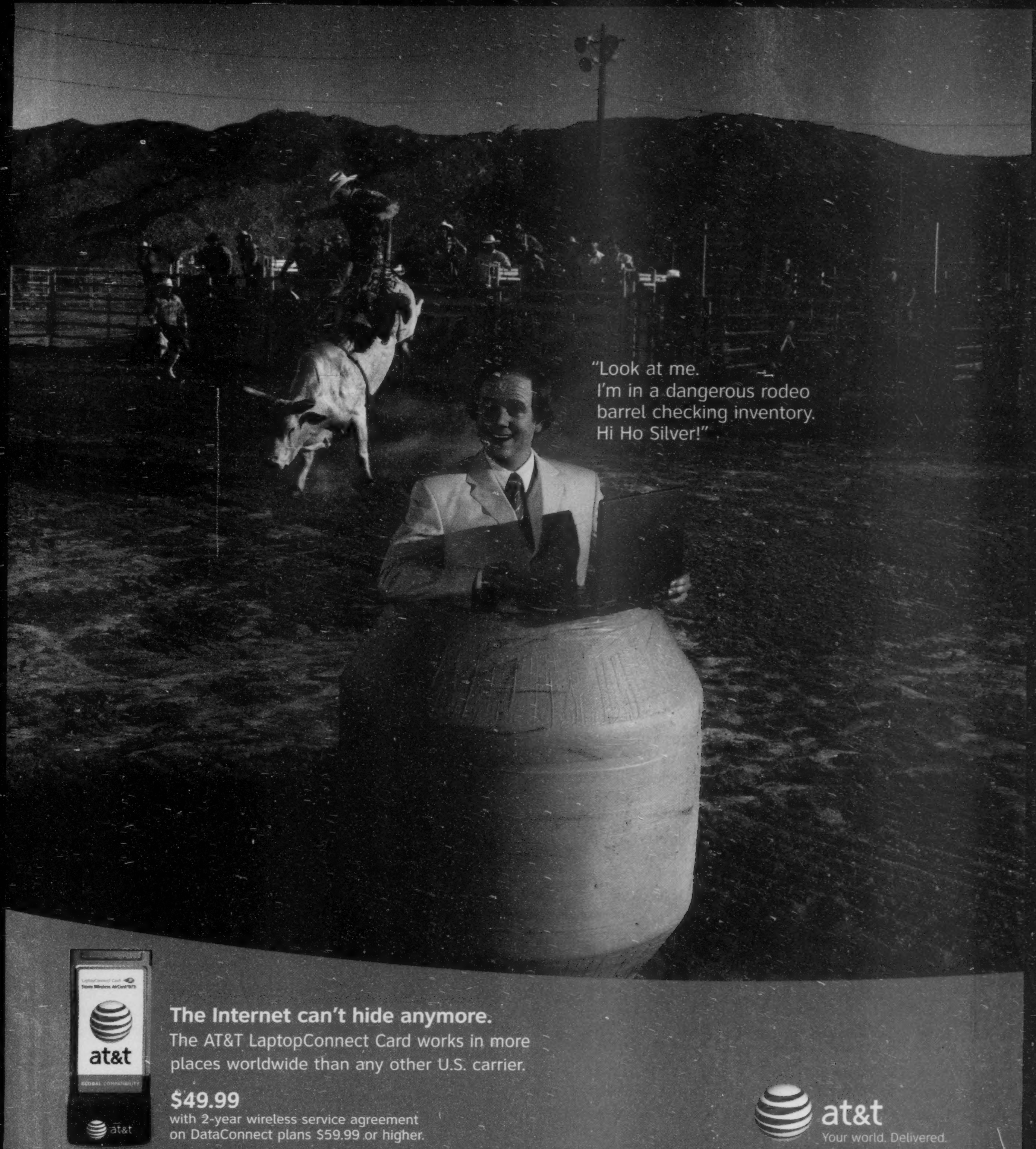
THE U.S. DEPARTMENT OF TRANSPORTATION isn't adequately protecting personal information stored in a database that state motor vehicle departments use to identify problem drivers, according to a report issued by the DOT's inspector general.

The mainframe-based National Driver Register (NDR) contains data such as names, dates of birth, sex, height and eye color of drivers nationwide who have been convicted of offenses.

The 42 million records in the NDR are encrypted, the report said. But, it added, similar controls aren't being applied when the data is transmitted to users via an external network.

In a written response, the National Highway Traffic Safety Administration said DOT officials are reviewing a draft "interconnection security agreement" requiring the organization that owns the network to encrypt data.

- JAIKUMAR VIJAYAN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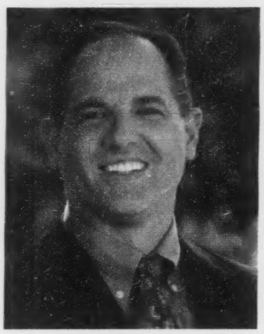
MANAGEMENT

Microsoft Fires CIO For Policy Violation

MICROSOFT CORP. disclosed last week that it had fired CIO Stuart Scott after an internal investigation found that he had violated company policies.

Kevin Turner, Microsoft's chief operating officer, announced Scott's termination in a memo sent to employees last Monday. The software vendor confirmed the firing but wouldn't elaborate on the reason Scott was let go or say when it expects to hire a permanent replacement.

Microsoft said that in the interim, the CIO duties will be shared by two people: Shahla Aly, general manager of worldwide services, strategy and planning; and Alain Crozier, corporate vice president and chief financial officer in the company's sales, marketing and services group.



Scott had worked at Microsoft for the past two years.

Scott, who was unavailable for comment, was rumored to have been placed on administrative leave more than a month ago.

In response to an inquiry from *Computerworld* after those rumors surfaced, a spokeswoman at Microsoft's public relations agency said that Scott appeared to be working in his office as normal. When asked again about the administrative-leave issue last week, another agency spokeswoman said, "We had no personal knowledge of that at that time."

Scott, who was a corporate vice president at Microsoft, joined the company in late 2005 as co-CIO and was given full control of its IT department late last year. He previously spent 17 years in IT jobs at General Electric Co., finishing his career there as CIO of the GE Industrial Systems division.

John Challenger, president of outplacement firm Challenger, Gray & Christmas Inc., noted that CIOs have access to many of a company's deepest secrets. Thus, there is an increasing desire among corporate executives to hold them to the highest standards of behavior, according to Challenger. "This job is for Boy Scouts and Girl Scouts," he said.

Art Crane, principal at and founder of Capstone Services, a human resources consulting firm in Sherman, Conn., said via e-mail that it's important for companies, "particularly one as visible as Microsoft, to deal with infractions swiftly."

Doing so, Crane added, sends a message "to employees, stockholders, regulators and the general public that [a company] won't tolerate violations."

— Eric Lai

Short Takes

Microsoft Corp. plans to issue two software updates tomorrow as part of its monthly release of security fixes. One of the updates is rated "critical" by the company; it addresses a remote code-execution flaw affecting Windows XP and Windows Server 2003.

The **Carnegie Mellon Software Engineering Institute** announced a set of best practices for IT purchasing. Supporters of the standards, which are based on the Capability Maturity Model Integration framework, include General Motors Corp. and the U.S. Department of Defense.

Gary Min, a former **DuPont** research scientist, was sentenced to 18 months in prison for illegally downloading thousands of confidential documents while he worked at the company.

Google Inc. and a group of mobile computing vendors announced a Linux-based software platform for use in mobile devices. Phones based on the Android technology are expected late next year.

SECURITY

Salesforce.com Warns Users After Taking Phisher's Bait

Some of Salesforce.com Inc.'s users are being targeted by e-mail messages containing fake invoices and malware – a problem that began when one of its workers was tricked by a phishing come-on into divulging an internal system password.

The password let the scammers access a customer contact list, according to a letter to users that was posted on the company's Web site last week.

In the letter, the hosted applications vendor said that "a small number" of customers had received bogus invoices. Some fell victim to the scam and gave up their own passwords.

Salesforce.com added that users this month reported "a new wave" of e-mails that appeared to be targeted more broadly. Those messages also included malware attachments, such as viruses and keyloggers.

Jan Sabelstrom, managing director of software consulting firm CaSa Customer Solutions LLC, said he got an e-mail purporting to be from the Federal Trade Commission that turned out to be a phishing attempt. The message contained information about a CaSa customer.

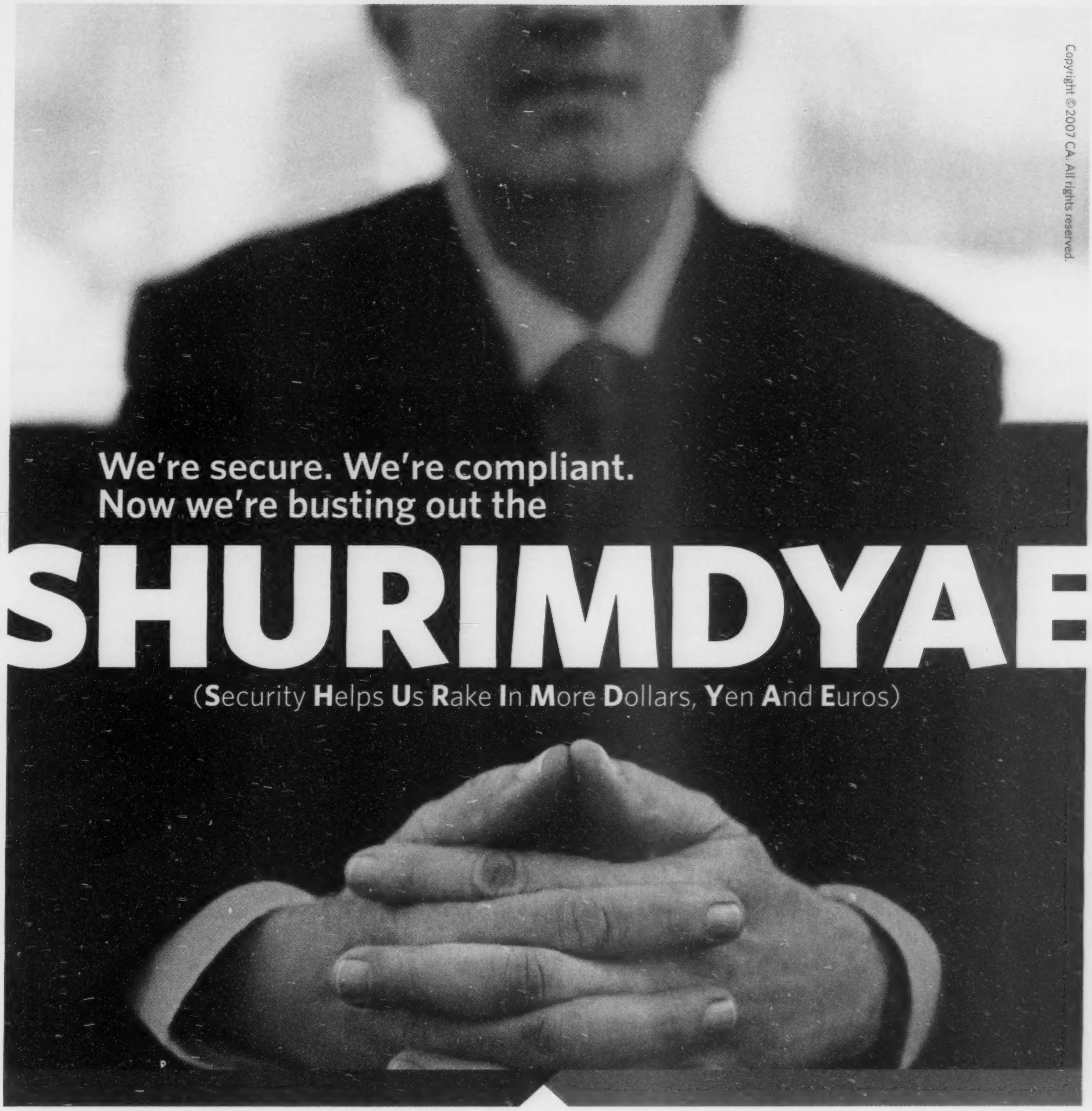
Sabelstrom said he e-mailed Salesforce.com CEO Marc Benioff about the scam on Oct. 30 and got a response within two hours. He said that convinced him that the vendor was taking the issue seriously.

– ROBERT McMILLAN, IDG NEWS SERVICE

FIGHTING PHISHING

Defensive actions recommended by Salesforce.com:

- Restrict application access to users who are on your corporate network or VPN.
- Educate employees not to open suspect e-mails.
- Consider using two-factor authentication technologies.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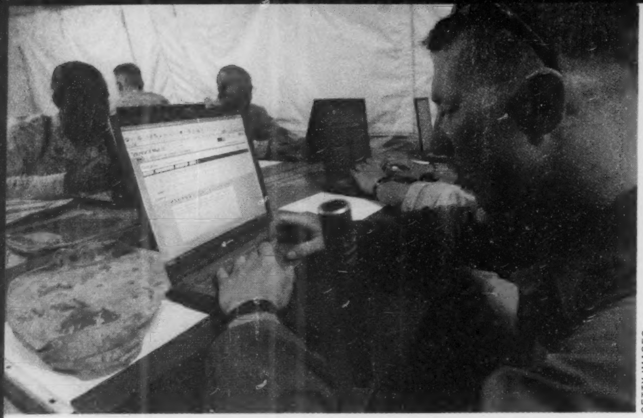


GETTY IMAGES

A Marine corporal uses the Internet to send e-mail at Al Asad Airbase in Iraq.

SERVERS

Marines Look for a Few Less Servers, Via Virtualization

THE U.S. MARINE CORPS plans to take server virtualization software into war — literally — as part of an effort to improve the way it deploys IT on the battlefield.

"The Marine Corps has always packed stuff up and taken it to the field — that is not new," said Maj. Carl Brodhun, the USMC's project officer for enterprise virtualization. "The ability to cram 35 applications into five or six physical hosts is relatively new."

Marines in the field can't count on having stable, high-capacity network connections, Brodhun noted, adding that "being able to compress a high number of applications into a constrained footprint" would reduce their connectivity needs.

The USMC, which has about 12,000 x86-based servers, is adopting an enterprisewide approach to virtualization via a deal with VMware Inc. The project includes a plan to reduce the USMC's current total of about 300 data centers to 30 facilities plus 100 "mobile platforms."

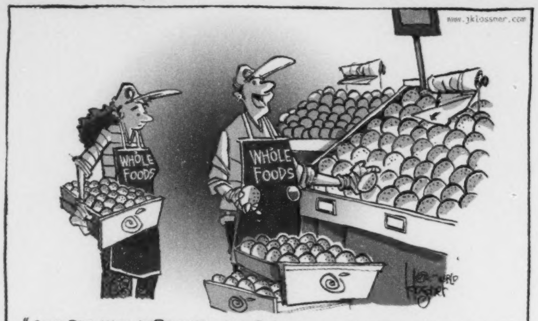
A major goal of the virtualization strategy is increasing system availability and operational continuity, Brodhun said. For instance, when IT workers want to take a server offline for maintenance now, they have to do the work at night and issue a half-dozen or so warning notices starting 30 days in advance.

With virtualization, they could simply move guest systems and their applications to another server, Brodhun said.

— Patrick Thibodeau

BETWEEN THE LINES

By John Klossner



"SOMEDAY, WITH HARD WORK AND PERSEVERANCE, MAYBE WE CAN ADVANCE to a POSITION in the COMPANY WHERE WE'RE NOT ALLOWED to BLOG."

BENCHMARKS LAST WEEK

Dell Inc. said it will make its most expensive acquisition thus far, a $1.4 billion cash purchase of **EqualLogic Inc.** EqualLogic is a vendor of iSCSI-based storage-area network products.

The Internet Corporation for Assigned Names and Numbers tapped Peter Dengate Thrush, a board member from New Zealand, to be its chairman. He replaces Internet pioneer Vint Cerf.

10 YEARS AGO: Rivals WorldCom Inc. and MCI Communications Corp. announced a $37 billion merger, the largest deal in U.S. history to that point.

Global Dispatches

Online Ticket Sales For Olympics Halted

BEIJING – The organizers of next summer's Olympic Games gave up on plans to sell tickets to Chinese residents online, admitting defeat after a crush of would-be buyers crashed the ticketing system.

The Beijing Organizing Committee said last week that it will instead offer tickets through a lottery.

The online ticketing system was overwhelmed shortly after sales began on Oct. 30. During the first hour of operation, the system received an average of 200,000 ticket requests each minute, but it was designed to handle a maximum of 150,000 per minute, according to the organizing committee.

Attempts to reconfigure the system so it could handle heavier loads failed, forcing a suspension of ticket sales.

Sumner Lemon,
IDG News Service

Microsoft to Build Irish Data Center

DUBLIN – Microsoft Corp. last week said it plans to spend more than $500 million to build a data center in Ireland. It will be the company's first major IT facility in Europe.

The 550,000-square-foot data center will be located at an office park in Dublin, Microsoft said. Construction is scheduled to begin this month and should be completed by mid-2009, it added.

The facility will be outfitted with tens of thousands of servers, according to Microsoft. The systems will be used to support online services such as MSN and Windows Live for customers in Europe, the Middle East and Africa.

Jeremy Kirk,
IDG News Service

BRIEFLY NOTED

EMC Corp. formally opened a research and development center in Beijing, its second R&D lab in China. Hopkinton, Mass.-based EMC said that it now plans to invest a total of $1 billion in China by 2012. That is twice what the storage, security and content management vendor said it would spend there in June 2006, when it opened its first R&D facility in Shanghai.

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Feds Prescribe More Money for E-health Push

New incentives for using EHR systems are on the way. But more may be needed to spur adoption. **By Heather Havenstein**

THE COST of installing and maintaining electronic health record (EHR) systems in doctors' offices has long been described as one of the biggest barriers in the way of President Bush's executive order that "most" Americans have EHRs by 2014.

Now the federal government hopes to start breaking down that barrier through a "demonstration project," under which it will pay higher Medicare reimbursements to up to 1,200 medical practices that deploy EHR systems. The U.S. Department of Health and Human Services announced the plan on Oct. 30, which was billed by HHS Secretary Mike Leavitt as a "red-letter day" in the push to spur the adoption of e-health technology.

Some doctors and health care IT executives applauded the proposed financial incentives, saying they could ease the cost burden enough to put EHR systems within the reach of small practices. But not everyone was so sure that the plan by itself would lead to widespread adoption of EHRs. Some in the latter group have noted that broader technology hurdles still need to be overcome.

Everyone did agree that the problem the HHS is trying to address is a real one.

Herb Smaltz, CIO at the Ohio State University Medical Center in Columbus, said that for many small medical practices, the cost of installing EHR systems continues to be prohibitive.

"If the incentives achieve a utility function for these physician groups, that will definitely spur adoption [of EHRs]," Smaltz said. "If insurance companies then follow suit and offer similar rewards and incentives, that should achieve the tipping point for adoption on an almost universal level."

Peter Embi, a physician and director of the University of Cincinnati Center for Health Informatics, said that EHR use can improve the efficiency of medical practices and reduce their costs somewhat over time. But those reductions often aren't sufficient to justify the expense and short-term disruptions of implementing an EHR system, Embi added.

"The real value in EHRs, when used to their fullest potential, is in improving the quality and safety of patient care," he said. Embi, who practices at a U.S. Department of Veterans Affairs clinic and uses the VA's Computerized Patient Record System, spoke during the HHS announcement about a patient who suffers from severe arthritis, gout and congestive heart failure.

Without the VA's EHR system, the care that the patient receives "would be slow and delayed," Embi said. "At worst, he might actually be harmed by some conflicting medications."

Improving health care quality can lead to lower costs, according to Embi. But he said that insurers and employers — "the payors of health care" — reap most of those cost benefits while leaving hospitals and doctor's offices to foot the bill for EHR investments.

Embi is still waiting for the HHS to spell out the details of the financial incentive program before he passes judgment on the plan's likely success. For now, though, he said that he sees the announcement as "a welcome step" toward a resolution of the cost issues.

If the incentives achieve a utility function for these physician groups, that will definitely spur adoption.

[illegible], CIO
OHIO STATE UNIVERSITY
MEDICAL CENTER

In the Health Information Management Systems Society's annual survey of health care executives, which was released in April, more than 20% of the 360 respondents listed cost as the biggest barrier to deploying IT systems. That made it the most-cited roadblock, HIMSS said.

Leavitt noted that only 10% of small medical offices and 5% of solo practitioners have installed EHR systems

Continued on page 20

PLUGGING IN

APRIL 2004: President Bush signs an executive order calling for the creation of a nationwide network for exchanging patient data.

MAY 2004: David Brailer is named the first national coordinator for health IT.

2004

JULY 2005: The HHS announces a public-private coalition to set standards for a nationwide EHR network.

NOVEMBER 2005: The HHS awards $18 million to four consortia to create health information network prototypes.

2005

MAY 2006: The EHR standards coalition makes its first recommendations to the HHS.

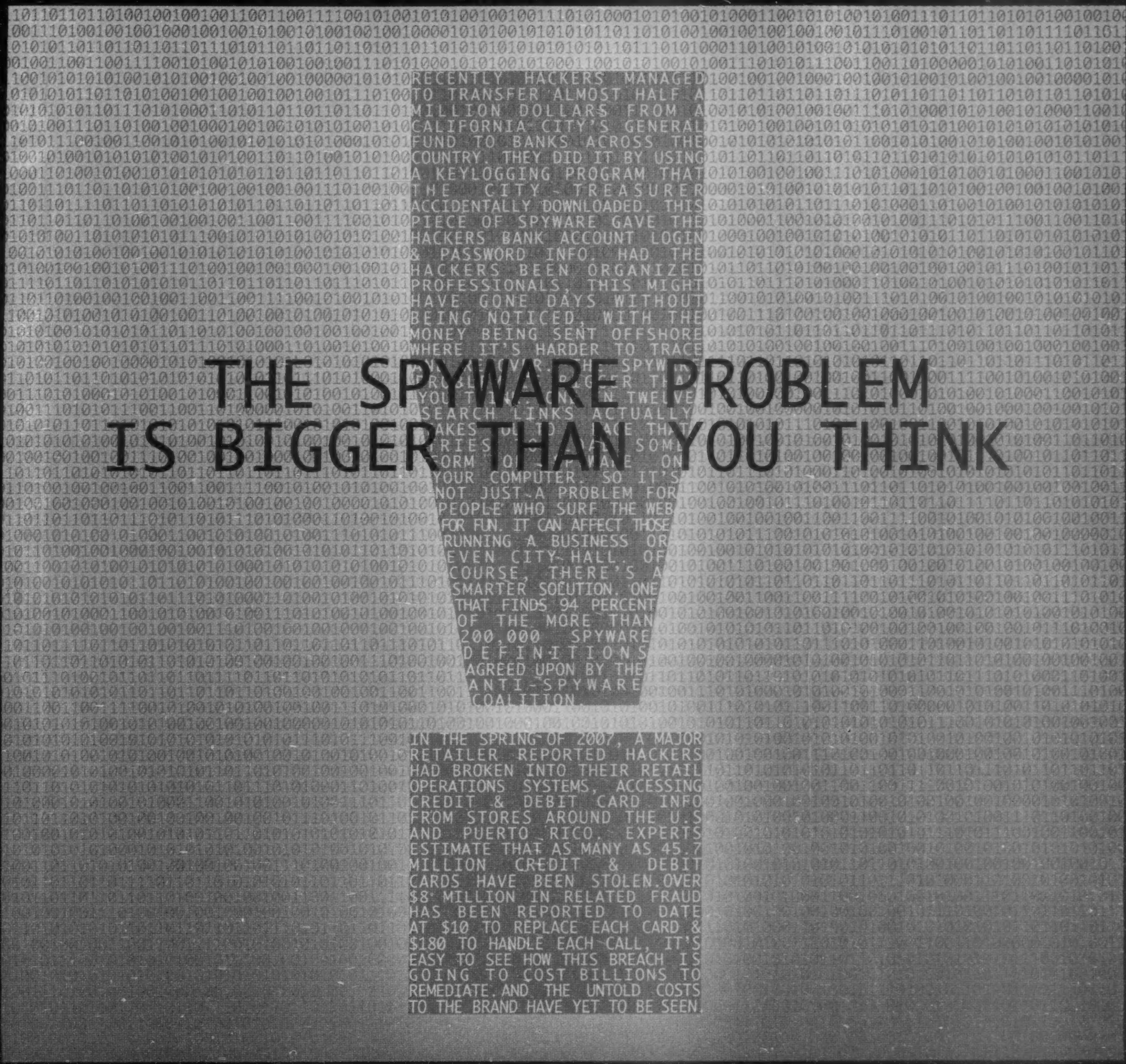
SEPTEMBER 2006: Robert Kolodner replaces Brailer, who had resigned earlier in the year.

2006

JANUARY 2007: The first nationwide health information network prototypes are publicly demonstrated.

OCTOBER 2007: The HHS says it will pay higher Medicare reimbursements to doctors who use EHRs as part of a trial project.

2007



THE SPYWARE PROBLEM IS BIGGER THAN YOU THINK

RECENTLY HACKERS MANAGED TO TRANSFER ALMOST HALF A MILLION DOLLARS FROM A CALIFORNIA CITY'S GENERAL FUND TO BANKS ACROSS THE COUNTRY. THEY DID IT BY USING A KEYLOGGING PROGRAM THAT THE CITY TREASURER ACCIDENTALLY DOWNLOADED. THIS PIECE OF SPYWARE GAVE THE HACKERS BANK ACCOUNT LOGIN & PASSWORD INFO. HAD THE HACKERS BEEN ORGANIZED PROFESSIONALS, THIS MIGHT HAVE GONE DAYS WITHOUT BEING NOTICED, WITH THE MONEY BEING SENT OFFSHORE WHERE IT'S HARDER TO TRACE. AND MOREOVER, THE SPYWARE PROBLEM IS BIGGER THAN YOU THINK. ONE IN TWELVE SEARCH LINKS ACTUALLY TAKES YOU TO A PAGE THAT TRIES TO LOAD SOME FORM OF SPYWARE ON YOUR COMPUTER. SO IT'S NOT JUST A PROBLEM FOR PEOPLE WHO SURF THE WEB FOR FUN. IT CAN AFFECT THOSE RUNNING A BUSINESS OR EVEN CITY HALL. OF COURSE, THERE'S A SMARTER SOLUTION. ONE THAT FINDS 94 PERCENT OF THE MORE THAN 200,000 SPYWARE DEFINITIONS AGREED UPON BY THE ANTI-SPYWARE COALITION.

IN THE SPRING OF 2007, A MAJOR RETAILER REPORTED HACKERS HAD BROKEN INTO THEIR RETAIL OPERATIONS SYSTEMS, ACCESSING CREDIT & DEBIT CARD INFO FROM STORES AROUND THE U.S AND PUERTO RICO. EXPERTS ESTIMATE THAT AS MANY AS 45.7 MILLION CREDIT & DEBIT CARDS HAVE BEEN STOLEN. OVER $8 MILLION IN RELATED FRAUD HAS BEEN REPORTED TO DATE AT $10 TO REPLACE EACH CARD & $180 TO HANDLE EACH CALL, IT'S EASY TO SEE HOW THIS BREACH IS GOING TO COST BILLIONS TO REMEDIATE. AND THE UNTOLD COSTS TO THE BRAND HAVE YET TO BE SEEN.

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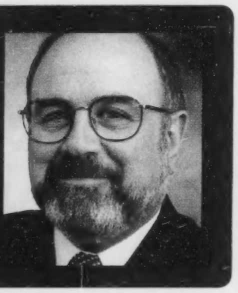
Continued from page 18

thus far. He said the financial incentives demonstration project is scheduled to last five years and will be overseen by the Baltimore-based Centers for Medicare & Medicaid Services, which are known as the CMS.

The CMS will begin working next spring with as many as 1,200 medical practices that have between three and five physicians. Participating practices will need to put EHR systems in place by the end of the program's second year and have them approved by an HHS-recognized certification body.

Once the technology is installed and certified, the medical practices that sign up will be required to use the systems to automate certain functions that can affect the quality of care, such as clinical documentation and prescription ordering. Leavitt said that during the first year of operation, participants will get straightforward increases in their Medicare reimbursements.

To the unknowledgeable, this was a ho-hum announcement. [But] to those of us dealing with this every day, this is a really big deal.



[illegible]
CHIEF MEDICAL OFFICER,
BLUE CROSS AND BLUE SHIELD

In the second year, additional incentives will be paid to practices that use the EHR software to report on their performance against national quality-of-care standards. Leavitt said further incentives will be added during the third year for practices that improve their care levels as a result of using the technology.

Doctors also will be able to get greater reimbursements as they deepen their investments in and use of EHRs, he said.

However, the HHS didn't specify how much it will increase the Medicare reimbursements as part of the demonstration project.

Steven Waldren, director of the American Academy of Family Physicians' Center for Health Information Technology in Leawood, Kan., noted that the success of the project will hinge on those details and others — such as whether the HHS will give medical practices any money upfront to help offset the cost of acquiring the EHR software.

It will also be important, Waldren said, to monitor whether private insurers increase their payments to physicians who use EHR systems.

At the Oct. 30 announcement, Leavitt acknowledged that the HHS is eager to have insurance companies join in the incentive effort.

Allan Korn, senior vice president and chief medical officer at the Chicago-based Blue Cross and Blue Shield Association, said that on the whole, his group is interested in taking part. But he added that Blue Cross and Blue Shield plans with more resources — for example, those in states such as Florida, New York and New Jersey — would be more likely to get involved before their smaller brethren do.

Overall, Korn views the incentive plan as a big step forward for EHRs. "To the unknowledgeable, this was a ho-hum announcement," he said. "[But] to those of us dealing with this every day, this is a really big deal."

Korn voiced optimism that the announcement by the HHS may help put "a chink in the armor" of medical practices that have been afraid to adopt EHRs because of the cost of doing so. "If we can get over that [fear] and demonstrate meaningfully in enough practices that it was a little pain but it was worth it — that is the tipping point we may be at," he said.

Korn pointed to the adoption of automated teller machines by banks as a similar process. "I'm sure the banks thought buying ATMs was going to cost a mint," he said. "Before you knew it, 75% of their tellers went away, and their customers were happier."

'NOT ENOUGH MONEY'

But Ron Paulus, chief technology and innovation officer at Geisinger Health System in Danville, Pa., said it's his understanding that the planned reimbursements would only amount to several thousand dollars annually per practice. That "is not enough money," particularly in light of the workflow and lost productivity issues that health care providers must grapple with when implementing EHR systems, he said.

"Several thousand [dollars] per practice is not going to compensate for that," Paulus said. "I'd be surprised if it is enough to really shift the market significantly." Paulus has experience with EHRs: Geisinger, which operates medical facilities in 40 Pennsylvania counties, has been using the technology for more than a decade.

And there are other issues that still need to be addressed before widespread adoption of EHRs is likely.

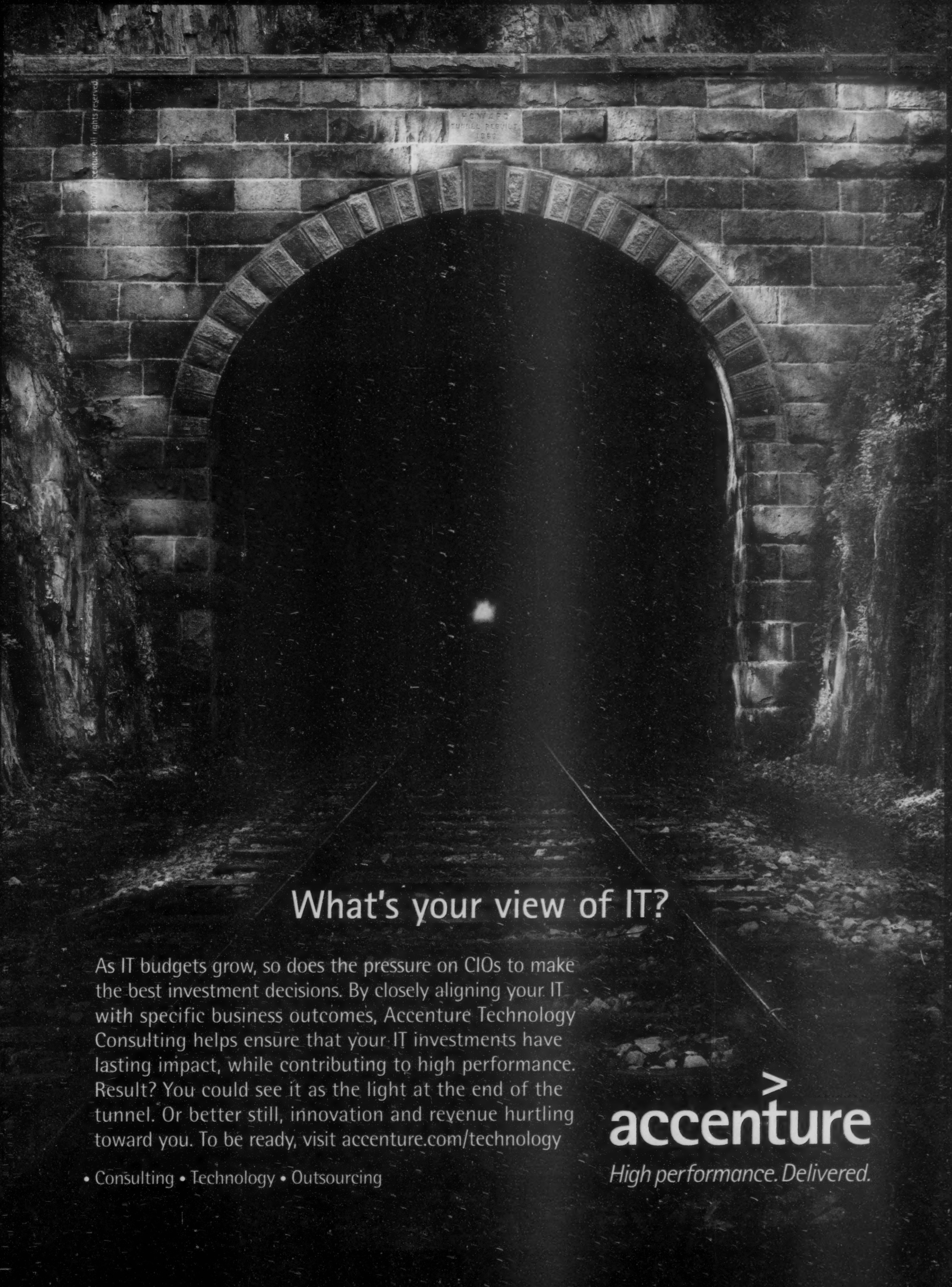
For example, Smaltz said that while regional health exchanges across the U.S. are working on methods for securely transferring patient data between systems from different vendors, final processes still need to be established. There also isn't a good method for ensuring that information is being taken from the right patient records when data is transmitted from one EHR system to another, he added.

"While sophisticated matching algorithms have been proposed as a means of accurately pulling the correct information on a given patient, no matter how good these algorithms are, I don't see them achieving 100% accuracy," Smaltz said. The situation is complicated by the need "to deal with patient information spread across multiple locations, multiple local record identifier schemas and over the life of a patient," he cautioned.

Mark Frisse, a biomedical informatics professor at Vanderbilt University in Nashville, said that the government also has to figure out a way to bring pharmacies into the EHR picture.

Frisse noted that one of the rationales behind the financial incentive plan for doctors offices is to boost the quality of patient care.

"To realize this potential, it will be equally important to connect the small pharmacy," said Frisse, who is leading an ongoing effort in Tennessee to enable health care providers to exchange electronic patient data. ■



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GETTY IMAGES

Whole Foods Handcuffs Execs On Web Postings

Stung by a furor over anonymous comments by its CEO, the grocer adopts an online gag order.

By Heather Havenstein

WHOLE FOODS Market Inc. has changed its code of conduct to ban company officials from posting anything business-related on external Web sites without permission — a decision that came after its top executive was caught bashing rivals and talking up Whole Foods' stock in anonymous forum posts.

John Mackey, chairman and CEO of Whole Foods, came under fire for his online activities last summer, when the U.S. Federal Trade Commission said in a lawsuit against the Austin-based company that he had written anonymous posts on Yahoo bulletin boards over the past eight years.

The FTC's lawsuit, filed in June, unsuccessfully sought to block Whole Foods from acquiring Wild Oats Markets Inc., a rival retailer of natural and organic foods, on the grounds that the deal would be anticompetitive.

But the FTC's legal filings did shed light on Mackey's online modus operandi. For example, in one anonymous posting cited in the lawsuit, Mackey disparaged the management of Wild Oats and questioned why any company would be interested in acquiring the grocer at its then-current stock price.

In a July entry on his Whole Foods blog, Mackey said that he wrote the external postings anonymously because it was "fun," and he claimed that he never intended any of them to be associated with him. He added that the comments sometimes were his personal opinions and at other times were efforts to play "devil's advocate" with online readers.

However, Mackey also issued a statement that month in which he apologized "for my error in judgment."

On Nov. 2, Whole Foods amended its internal policies in reaction to the posting brouhaha. Now, the grocer's code of conduct says that no member of the management team can "make any posting to any noncompany-sponsored Internet chat room, message board, Web log or similar forum concerning any matter involving the company, its competitors or vendors."

The amended policy goes on to say that the ban applies to postings made "under their name, anonymously, under a screen name or communicating through another person." The only exception is if the governance committee of the Whole Foods board has approved a posting. Violations are grounds for dismissal.

A Whole Foods spokeswoman declined to comment about the policy change last week.

Josh Bernoff, an analyst at Forrester Research Inc., said that many companies are hammering out policies on what their employees can say online. The new policy adopted by Whole Foods "is an overreaction — perhaps an appropriate overreaction, given what happened," he said.

Companies such as Hewlett-Packard Co. and Microsoft Corp. have adopted much broader policies with regard to blogs and other online postings, Bernoff noted. They simply prohibit employees from posting information that would violate legal rules or harm them competitively, he said. Microsoft's policy, he added, is a single sentence: "Don't be stupid."

> **The new policy adopted by Whole Foods restricts postings 'concerning any matter involving the company, its competitors or vendors.'**

Tom Austin, an analyst at Gartner Inc., said that less than 10% of companies he has talked to have policies prohibiting employees from making online postings. At the other end of the scale, about 20% encourage blogging and other postings and have developed guidelines on who can post and what they can discuss, he said.

The rest have yet to craft policies, Austin added. "The whole role of blogging and the difference between corporate and personal behavior — we're still pretty early-stage of people knowing what works," he said. ■

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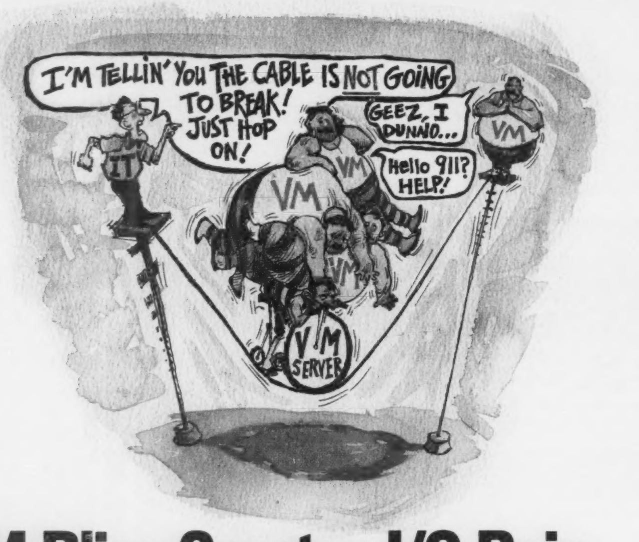
On the Mark

HOT TRENDS ■ NEW PRODUCT NEWS ■ INDUSTRY BUZZ BY MARK HALL


I'M TELLIN' YOU THE CABLE IS NOT GOING TO BREAK! JUST HOP ON!
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GEEZ, I DUNNO...
Hello 911? HELP!
VM
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MATTHEW FAULKNER

VM Bliss Creates I/O Pain

BEWARE OF unintended consequences. Take virtual machines, for example. They're ideal for taming server sprawl, reducing power consumption in the data center and keeping IT management costs down. But demand for server I/O skyrockets as multiple guest operating systems and their applications stress what one physical server can deliver. Gary Orenstein, vice president of marketing at Gear6 in Mountain View, Calif., says that by deploying a centralized network cache, such as his company's Cachefx technology, IT managers can create VMs to their hearts' content without worrying about performance bottlenecks. Gear6 has two cache appliances: the G200, which can store 250GB of data, and the G400, which can pack 500GB. Both handle more than 250,000 I/O operations per second. In the works for next year are smaller and larger appliances, Orenstein says, with the biggest targeted at 1TB of cache. He says IT needs "a change of mentality" in thinking about network cache devices. Instead of looking at cost per gigabyte, he says, IT should start looking at cost per I/O. Cost of Cachefx? It starts at $350,000.

$1.8B
Virtual machine market in 2009, predicts IDC.

Use Ethernet Mesh For Your I/O Woes

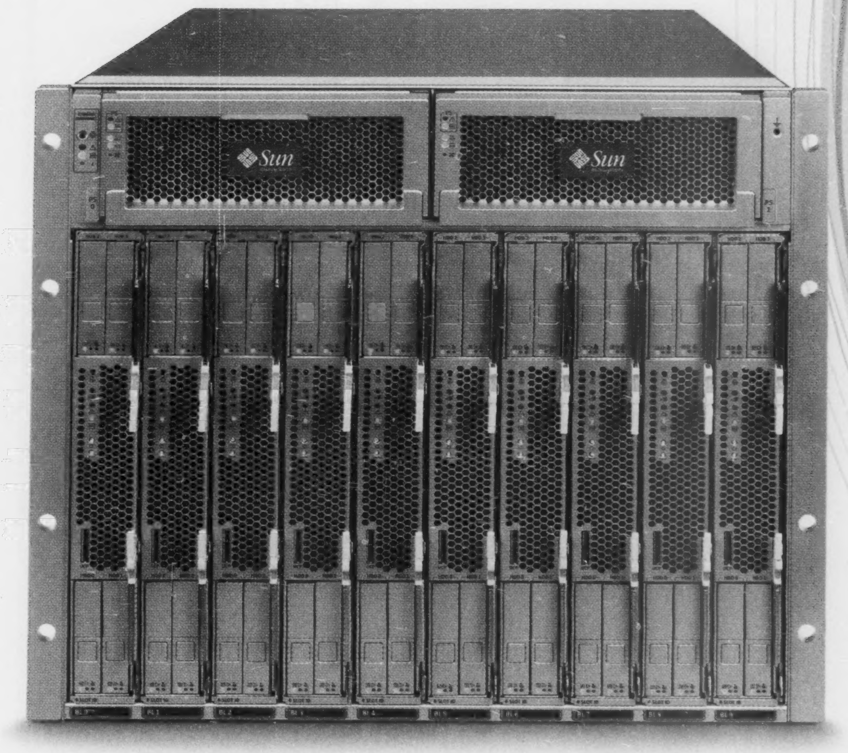
Derek Granath, vice president of marketing at Woven Systems Inc. in Santa Clara, Calif., agrees with the Gear6 folks that virtualization is increasing I/O demand. But he argues that other data center problems, such as the growth of unstructured data in SANs, can also degrade performance. His fix for multiple performance bottlenecks in the data center is to use industry-standard 10Gbit/sec. Ethernet technology, specifically Woven's multipath mesh switches, to create thousands of potential paths for the data to flow along. Granath claims that the switches are smart enough to know which of the many paths is fastest at any given moment. Packets transmitted by Woven switches are followed by a tiny probe packet that measures latency so the switches know where the slowdowns are. At the end of this month, Woven will release its TRX 100 switch with 48 server links and four 10Gbit/sec. Ethernet ports. Pricing starts at $7,950.

Woven's TRX 100 creates a 10Gbit/sec. Ethernet mesh for fast networks.

Monitor the Deluge Of Virtual Servers

Another vice president of marketing, Ken Klapproth of Marlboro, Mass.-based Entuity Inc., sees the VM phenomenon as indicative of bigger problems confronting IT: the number of "ever-expanding applications now using the network" and end users' "thirst to connect to more data resources." The cure, Klapproth says, is network management software that goes beyond the features of point tools while avoiding the cost and complexity that he asserts come with larger-scale management frameworks. Not surprisingly, Klapproth suggests that Entuity's Eye of the Storm does the job. The 2008 release, which will be ready at the end of the month, offers advanced reporting modules, including at-a-glance graphical views of network conditions. Also, the software now has a configuration monitor that lets you save settings on Cisco network devices. It can alert you in real time when the configuration data has changed, and it then lets admins easily switch back to the previous known good state. The upgrade also includes a progressive discovery feature that lets you continuously snag data on any SNMP-capable device on your network — even those you choose not to monitor. Oh, and of course, the new release can now monitor the health of virtual servers, so you know the condition of each virtual machine. Pricing for Eye of the Storm 2008 starts at $50,000. ■

Klapproth: Improve your network insight with Eye of the Storm 2008.



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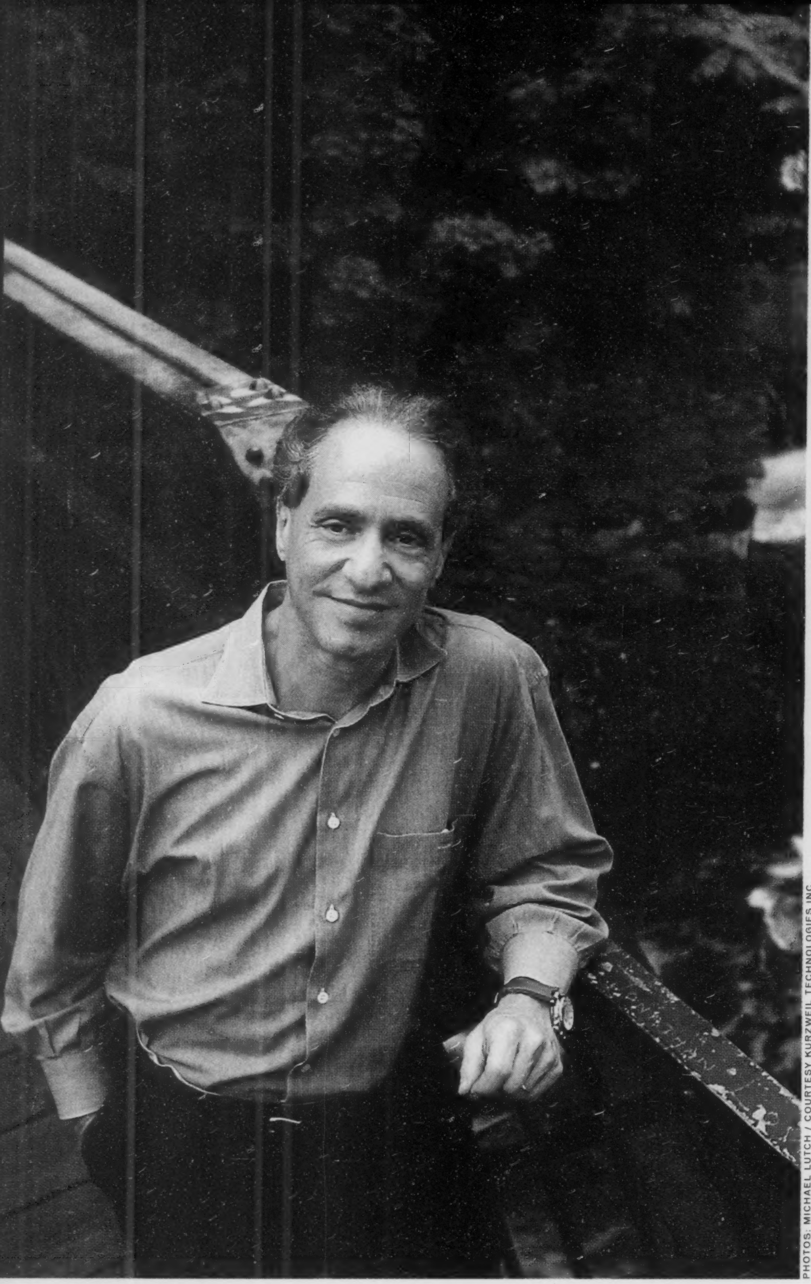

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■ THE GRILL

Ray Kurzweil

The futurist and **inventor** talks about **pervasive computing, augmented reality,** and **storage** as a **philosophical issue.**

Dossier

NAME: Ray Kurzweil

TITLE: Founder and CEO, Kurzweil Technologies Inc.

LOCATION: Suburban Boston

INVENTION HE'S MOST PROUD OF: "The Kurzweil Reading Machine for the blind. What's exciting for an inventor is to have your inventions be used and actually have a benefit for their users. So the kind of feedback I've gotten from blind students and blind people, who say they couldn't have held their jobs without the Kurzweil Reading Machine, has been the most gratifying."

WEB SITES VISITED EVERY DAY: Slashdot.org, Foresight.org and Singinst.org

FAVORITE MUSICAL WORK: "I like artists from many genres, ranging from Carrie Underwood and Alanis Morissette to Eminem. For classic rock, I like the Beatles and Jefferson Airplane. My favorite classical composer is Beethoven."

MOST THOUGHT-PROVOKING MOVIE HE'S SEEN: "*Alien* captured the organic nature of advanced technology. *The Matrix* series captured the realism of virtual reality and the nature of virtual worlds and virtual personalities."

Ray Kurzweil is a futurist and author whose book The Singularity Is Near: When Humans Transcend Biology *(Viking Adult, 2005) predicts advances in computing technologies and biological research over the next four decades, culminating in the merger of biological and nonbiological intelligence. Kurzweil is also a prolific inventor who has developed hardware and software for optical character recognition, speech recognition and electronic music.*

At the heart of your book is the idea that technology advances exponentially. Can you explain? Technology, particularly if we can measure the information content, proceeds exponentially, not linearly. And a lot of people don't real-

Continued on page 28

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> **“We'll also have augmented real reality. The computers will be watching what you watch, listening to what you're saying, and they'll be helping.**

Continued from page 26

ize that, and that's one of the reasons long-term forecasts generally fall substantially short of the ultimate reality.

If we look at information technology, we see this reflected in an exponential growth in the power of those technologies. The price/performance for computing is literally doubling every year. Information processes are revolutionizing every industry, every area of technology. And so [areas] like health and medicine, which used to be hit-or-miss, are now becoming information technologies and will be subject to what I call this law of accelerating returns.

How will hardware technologies evolve over the next 10 years? If you go out 10 years, computers are not going to be these rectangular objects we carry around. They're going to be extremely tiny. They're going to be everywhere. There's going to be pervasive computing. It's going to be embedded in the environment, in our clothing. It's going to be self-organizing.

We're going to solve this dilemma we have now with displays. On the one hand, people like 50-inch screens, and they'll spend thousands of dollars on them. On the other hand, they like watching movies on a 1- or 2-inch screen, but that's really not a satisfactory experience. We are going to solve that by putting the displays in our glasses, which will beam images to our retinas. This will create very high-resolution virtual displays that can hover in the air. And it can also completely overtake your visual field of view in three dimensions, creating full-immersion visual/auditory virtual reality.

We'll also have augmented real reality. The computers will be watching what you watch, listening to what you're saying, and they'll be helping. So if you look at someone, little pop-ups will appear in your field of view, reminding you of who that is, giving you information about them, reminding you that it's their birthday next Tuesday. If you look at buildings, it will give you information, it will help you walk around. If it hears you stumbling over some information that you can't quite think of, it will just pop up without you having to ask.

What's your definition of artificial intelligence? Artificial intelligence is the ability to perform a task that is normally performed by natural intelligence, particularly human natural intelligence. We have in fact artificial intelligence that can perform many tasks that used to require — and could only be done by — human intelligence. There are hundreds of examples today, and they are deeply embedded in our economic infrastructure.

All communication is governed by intelligent algorithms that route and connect the information. Programs are embedded into computer-assisted design systems. AI flies and lands airplanes, guides intelligent weapons systems, places billions of dollars of financial transactions each day.

These examples are narrow AI, in that they are performing specific tasks, very often sophisticated tasks that required human experts to perform.

What could slow down the arrival of strong AI, or of the “smarter than human” technologies you call the Singularity? There are really two areas to think about. One is hardware and one is software. There's a strong consensus that the hardware will be available. So, the key issue is how long it will take to get the software and science. I make the case that a 20-year horizon is a conservative estimate, based on the exponential progress we're making in reverse-engineering the human brain.

In one of your earlier books, *The Age of Spiritual Machines*, you have a chapter titled “2009.” And you nailed quite a few technologies pretty well. But one technology that didn't seem to fulfill the promise that you anticipated was speech recognition. Well, first of all, this isn't 2009 yet. We need exponential progress in computation to get linear gains in speech recognition accuracy, because we are making exponential gains in computing. And a lot of people's impressions of speech recognition are based on having tried it three, four, five years ago. It's actually improved a great deal.

Language translation is quite good, particularly now that we have these large Rosetta Stones of matching text in different languages, so the statistical approach of doing language translation with very large Rosetta Stone text to train on, using pattern-recognition techniques, gets very excellent results.

You have also discussed an intriguing invention that you call the “Document Image and Storage Invention,” for long-term storage of computer files. But you have concluded that it really wouldn't work. Why? Software formats are constantly changing. Try resuscitating some information on some PDP-1 magnetic tapes. Even if you could get the hardware to work, the software formats are completely alien, and nobody is there to support these formats anymore.

I think this is fundamentally a philosophical issue. I don't think there's any technical solution to it. Information actually will die if you don't continually update it.

— Interview by **Ian Lamont**

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BIGFIX Discovery 7.0 specifications

Drivetrain	Engine	Real-time & Policy-driven
	Power	1 server per 200K endpoints
	Torque	AV to 10K devices < 4 hrs
	Displacement	Microsoft, McAfee, Symantec, LANDesk
	Compression	Days/Weeks into Mins/Hrs
	Transmission	Query 95% endpoints < 15 min
	Acceleration	One-and-only BigFix agent
	Braking failsafes	97% confirmation ans. < 4 min
Footprint	Viewing Radius	Single-console view of Universe
	Height/Width	< 2% CPU, 10MB disk space
	Safety	Eliminate attacks, malware, & rogue devices
	Test Data Verified in Battle	Discovered 400 rogue assets per week on a 50K endpoint network spanning 2300 locations.

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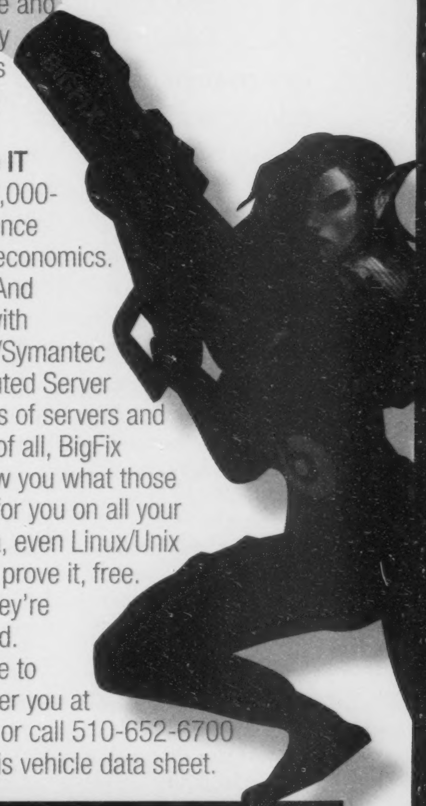

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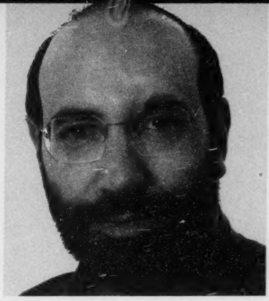
TRBA

OPINION

Michael Gartenberg



Apple Makes a Big Leap With Leopard

LEOPARD, the latest release of Apple's Mac OS X, lays the foundation for the next generation of personal computing. It offers a better user experience as well as the reliability inherent when you are able to integrate hardware and operating system. It's an evolutionary release with parts that are downright revolutionary.

I don't have the space here to give you a complete rundown on what Leopard can and can't do, and *Computerworld* has already done that online. What I can tell you is how Leopard has impressed me.

Boot times were quick, and the system's Sleep and Resume features worked flawlessly on the MacBooks I used for testing. On a variety of G5 and Intel-based Macs, I had no performance or stability issues, even when I upgraded from Leopard's predecessor, Tiger, instead of performing a clean update. In only one instance did a system freeze. That's a level of stability I haven't achieved with any machine running any other operating system.

As with most new operating system releases, computers older than, say, 18 or 24 months may need an upgrade of memory or disk drives. While Apple lists 512MB of RAM as a system requirement, 2GB is a more realistic number. Of course, your mileage may vary.

As with Windows Vista, a lot of that memory is needed to support the eye candy. Apple has again redefined what personal computing looks like. Tiger fared well against Microsoft's offerings, but Leopard takes a real leap ahead. It builds upon the already solid Mac OS X platform and advances almost all of the core features. The Finder has been given a new coat of virtual paint, with transparent menus and a new Dock that "reflects" the applications stored there. Users can collapse applications and document folders into the Dock and then easily access them via fly-out menus. Cover Flow, a feature first used in iTunes, lets you browse files visually and then see a file's contents without opening it.

■ Does any of this matter to IT? More and more, it does.

Apple's IM client, iChat, runs rings around what's available for other systems. It now has green-screen capabilities that allow users to place themselves in front of still or animated backgrounds, and it lets users share screens or applications for collaboration.

Vista has widgets, but they can't beat Leopard's for ease of use. Dashboard lets users take any Web page and turn it into a widget that auto-updates, going well beyond the concept of creating HTML applets that can show snippets of information.

I've always used my e-mail in-box as a to-do list, and Apple's Mail client makes that really work. You can turn any e-mail in your in-box into an item on a to-do list and then keep track of what needs to be done.

Does any of this matter to IT? More and more, it does, now that getting Apple's software to work as part of an infrastructure is mostly a nonissue. And Boot Camp, Apple's method for running Windows natively on Intel-based Macs, allows those who must use Windows applications to consider a Mac. (With Leopard, Boot Camp is integrated directly into the operating system.)

There's no doubt that the vast majority of IT shops will stick with Windows, but there are always users for whom a Mac makes sense. Thanks to Boot Camp, it's no longer a one-or-the-other question. And there's certainly appeal in Leopard's host of refined productivity features and rock-solid stability. With little or no price premium for a Mac, more will say yes. ■

Michael Gartenberg *is vice president and research director for the personal technology and access and custom research groups at JupiterResearch in New York. Contact him at mgartenberg@optonline.net. His weblog and RSS feed are at* http://weblogs.jupiterresearch.com/analysts/gartenberg.

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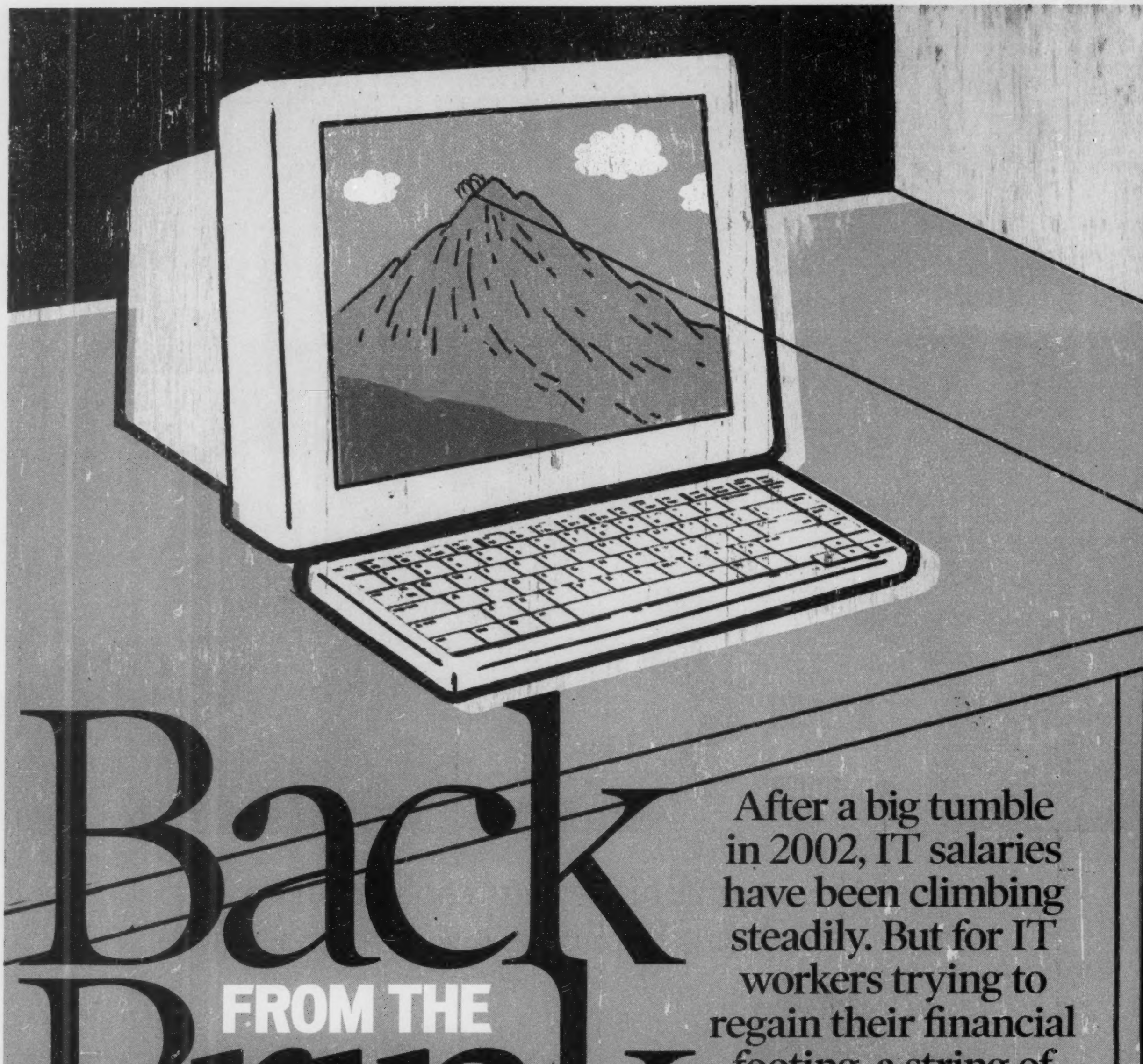
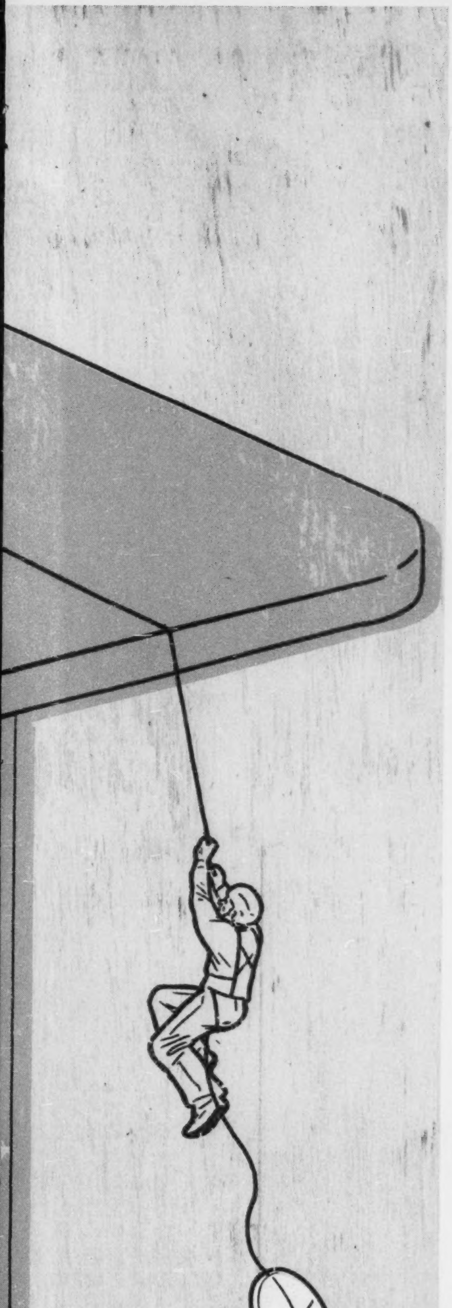


Back FROM THE Brink

After a big tumble in 2002, IT salaries have been climbing steadily. But for IT workers trying to regain their financial footing, a string of 3% increases makes the going tough.

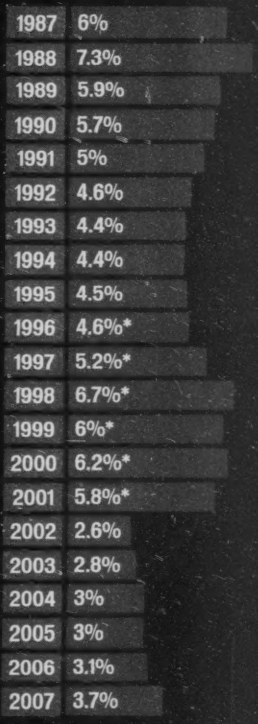
BY THOMAS HOFFMAN



DAN PAGE

REGAINING MOMENTUM

IT salaries have risen at a slow but steady pace since hitting rock-bottom in 2002. IT pay raises from 1987 to 2007:



*In these years, IT workers were surveyed about changes in their total compensation. All other years show only salary changes.

SOURCE: COMPUTERWORLD SALARY SURVEY

JASON KENT is in a tough spot.

As an assistant information systems analyst at the California Department of Corrections and Rehabilitation in Corcoran, Kent splits his time between providing help desk support to 400 to 500 end users and handling IT procurement activities.

Kent's workload has increased considerably since he joined the IT group three years ago. His salary has increased, too, with a 5% annual pay increase this year through his union contract. That's a good measure higher than the 3.7% average increase that other IT professionals fetched in 2007, according to *Computerworld*'s 21st Annual Salary Survey (see chart at right).

Problem is, a 5% boost for Kent works out to only a nominal increase. He started with the corrections agency at a salary well below the $80,000 median for the 9,290 IT workers and executives polled by *Computerworld*. And while living and working in the Corcoran area, which sits halfway between Fresno and Bakersfield, isn't as expensive as it would be in Los Angeles or Sacramento, it has been difficult for Kent and his family to make ends meet.

Although he has explored other opportunities, Kent fears that if he takes a position in the private sector, he'll end up with less job security.

But "I'm not making much more than I would if I were the manager of a McDonald's or a Starbucks," he says.

Although IT professionals who work in the public sector typically earn less than their private-sector peers (see industry charts, page 45), Kent's situation reflects the challenges that many working-class technologists are facing. According to the Bureau of Labor Statistics, U.S. IT employees still earn an average wage more than double the $36,140 median income for full-time workers; however, double-digit increases in gas prices and rising costs for groceries and other items are devouring their salary gains.

Yet there is good news for IT pros. After a substantial drop in 2002, IT pay has been slowly recovering, with small gains reported in each of the five years that followed. Plus, 75% of respondents to this year's survey reported that their salaries had increased, and 72% reported an increase in 2006. And maybe most important, demand for those with specific IT skills, such as seasoned Web developers and people with network convergence skills, continues to climb and place upward pressure on salaries, according to recruiters, hiring managers and labor experts. In fact, IT workers with jobs that utilize their Web and networking skills saw their salaries outpace the 3.7% median increase (see "Biggest Winners," page 41).

"There's a supply-and-demand impact here," says David Van De Voort, a consultant at Mercer Management Consulting Inc. in Chicago. Although IT workers' compensation isn't skyrocketing like it was in the dot-com years, their wage gains continue to outpace those of the general workforce, he adds.

Meanwhile, many CIOs say turnover

Continued on page 36

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_INFRASTRUCTURE LOG

_DAY 56: Our voice and data networks are out of control. Nothing's unified. Nothing's integrated. We have to use different devices for different things. Gil's had enough.

_He's welding every device in the office together with a blowtorch. He calls it "The Unifier."

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Lotus.

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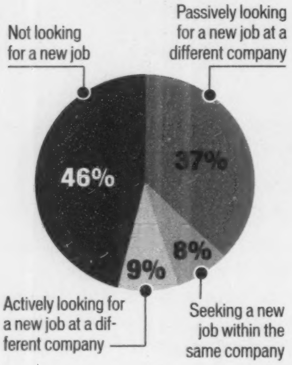
21st
ANNUAL
SALARY
SURVEY

ON THE LOOKOUT

Which one of the following best describes your job search status?



WHY THEY'RE LOOKING

The top five reasons they're looking for a new job:

Looking for higher compensation	64%
Career opportunities	48%
Seeking more interesting/ challenging work	46%
Looking for more personal fulfillment	44%
Seeking more responsibility	30%

BASE: 5,031 IT EMPLOYEES
NOTE: MULTIPLE RESPONSES ALLOWED.

A GROWING TALENT SHORTAGE

The top seven challenges facing workers in the IT industry today:

1	Alignment of IT with the business	24%
2	Outsourcing	21%
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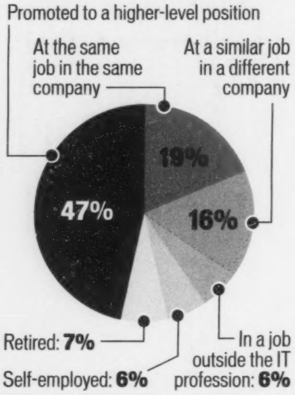
5	Gap between required skills and training available	9%
6	Job security DOWN FROM NO. 4 IN 2006	7%
7	The economy	6%

NOTE: MULTIPLE RESPONSES ALLOWED.

IN 2012

Where do you expect to be in your career five years from now?



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WHAT TRUMPS MONEY

43% of respondents said they wouldn't consider switching to a job with lower compensation. Of those who would, here are the top five enticements:

1. Better work/life balance
2. More job satisfaction
3. Location
4. Flexibility
5. Stock options

SOMETHING EXTRA

The top five types of bonuses that survey respondents have received:

Performance	31%
Year-end/annual	24%
Profit sharing	17%
Team	6%
Project completion	4%

40% reported receiving no bonuses.

NOTE: MULTIPLE RESPONSES ALLOWED.

BASE FOR ALL CHARTS, UNLESS OTHERWISE INDICATED: 9,290 IT EMPLOYEES

Continued from page 33

is starting to creep up while demand for project management, J2EE and enterprise architect skills are pushing salaries for many of those professionals higher, says Van De Voort. But that tells only part of the story. Although heightened demand for IT skills is lifting compensation across the market, not everyone is benefiting.

Take Tammy Wicks, a business applications analyst who has been at FedEx Freight Corp. in San Jose for the past 12 years. For Wicks and many other U.S. IT workers, annual bonuses are dependent on corporate profitability targets being met. Wicks' bonus decreased this year after having risen steadily for the past few years, she says.

Meanwhile, the 4% pay raise she received "is definitely not a cost-of-living increase, especially where I live," in pricey Silicon Valley, she says.

Wicks says she's "completely indifferent" regarding her latest raise. "Increasing my skill set doesn't guarantee me a raise in any way, shape or form," says Wicks. "But I'm not actively seeking" another job, she adds, partly because competition for IT employment in Silicon Valley is so intense.

PROACTIVE PAY RAISES

The tight IT labor market is one of the reasons why Saladinos Inc., a food service distributor in Fresno, Calif., handed out 6% to 7% salary increases to its IT staff this year, says CIO Craig Urrizola.

After having outsourced network and application support over the past few years, the company now employs seven IT staffers who primarily focus on optimizing and re-engineering Saladinos' business operations, says Urrizola.

"We're trying to keep them from looking outside," he says. It helps that the business process work "keeps them engaged and motivated," he adds.

Didi Raizen, an IT applications manager at Flatiron Construction Corp. in Longwood, Colo., says she's happy with the 8% raise she received this year after having received 3% to 4% raises for the past few years. But she had to "fight" for her increase, partly by rallying end users to lobby on her behalf.

Below-median pay is de rigueur in the nonprofit sector, says Don Gillett, director of information management at the North Carolina Biotechnology Center in Research Triangle Park. As such, IT salaries for his staff "are probably where they should be," says Gillett, who says he relies on staffing services firm Robert Half Technology, *Computerworld* and other sources to gauge labor rates.

"Our staff likes to be associated with an organization that does good things," says Gillett. "If they didn't feel their salary was satisfying them, I don't think they'd stay very long."

Indeed, a higher percentage of IT professionals, such as Jeff Blackmon, reported being satisfied with their compensation this year (57%) than in 2006 (54%).

Blackmon, a business continuity consultant at L-3 Communications Holdings Inc. in Kansas City, Mo., took matters into his own hands five years ago by returning to school. He has obtained his CISSP information security certification and a master's degree in information systems management from the Keller Graduate School of Management at DeVry University.

"I was getting caught in that 3% to 4% [annual raise], and I could see that it wasn't good," says Blackmon. "So I decided to manage my own career." Now, he says, "my salary for what I do is very good, right up there with U.S. averages."

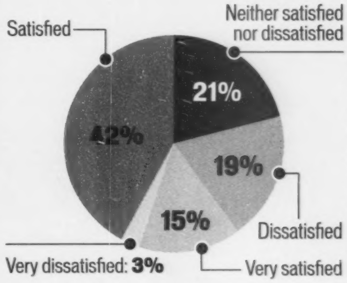
Still, salary satisfaction is a relative term for others, such as Karen Piper.

When Piper was laid off in May 2006 after eight years at Sun Microsystems Inc., she took an 18% pay cut to become a business intelligence analyst at Ball Corp. in Broomfield, Colo., the following month. "For now, I'll wait and see what the next pay increase is and what projects I work on and where it goes from there," says Piper, who expects to earn a master of science degree from Regis University by the end of 2008.

For his part, Gillett doesn't think the industry needs to fear another salary retreat like the one the market experienced in 2002. "Some people entered IT [in the late 1990s] thinking they could walk in the door and make $50,000 — and they could," he says. But now, he notes, the people who continue to work in IT are generally those who have a professional interest, not those "who just want to make a big salary." ■

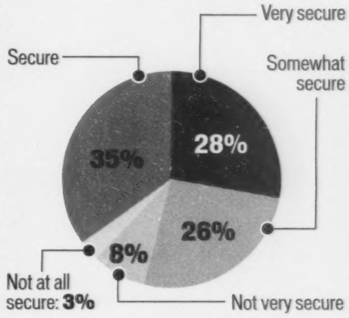
MONEY

How satisfied are you today with your total compensation package, given your base salary, bonuses and benefits in relation to your job responsibilities?



JOB SECURITY

How secure do you feel your current position is?



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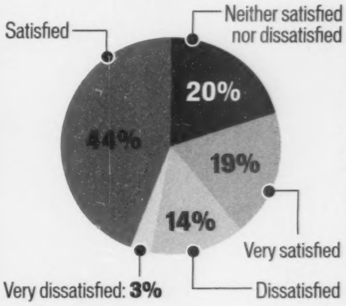
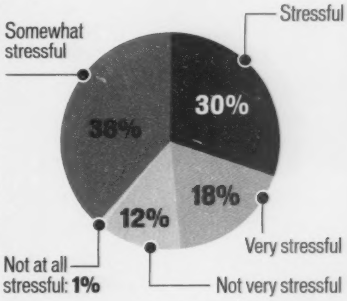


THE STRESS FACTOR

How stressful is your job?



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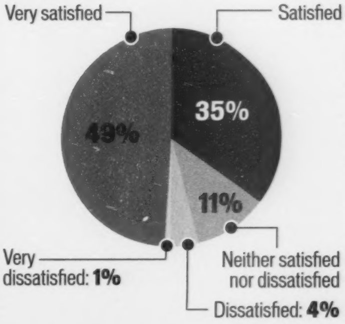

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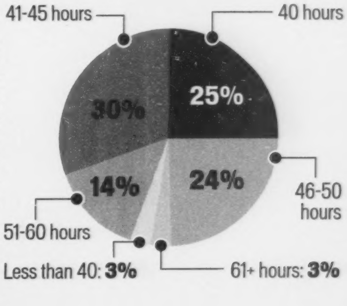

BASE FOR ALL CHARTS: 9,290 IT EMPLOYEES
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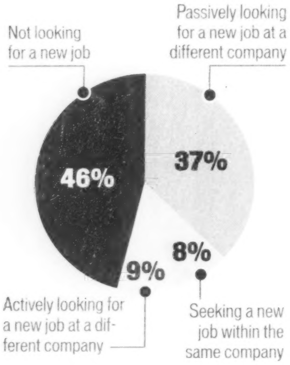
ON THE LOOKOUT

Which one of the following best describes your job search status?



WHY THEY'RE LOOKING

The top five reasons they're looking for a new job:

Looking for higher compensation	64%
Career opportunities	48%
Seeking more interesting/challenging work	46%
Looking for more personal fulfillment	44%
Seeking more responsibility	30%

BASE: 5,031 IT EMPLOYEES
NOTE: MULTIPLE RESPONSES ALLOWED.

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BASE FOR ALL CHARTS, UNLESS OTHERWISE INDICATED: 9,290 IT EMPLOYEES

A GROWING TALENT SHORTAGE

The top seven challenges facing workers in the IT industry today:

1	**Alignment of IT with the business**	24%
2	**Outsourcing**	21%
3	**Keeping up with technology advancements**	19%
4	**IT talent shortage** **UP FROM NO. 6 IN 2006**	12%
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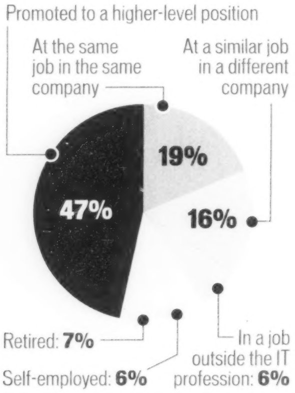

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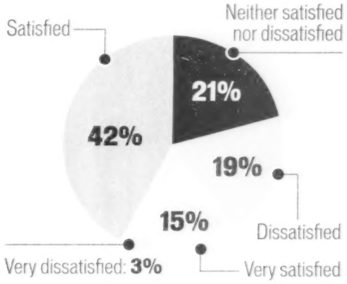

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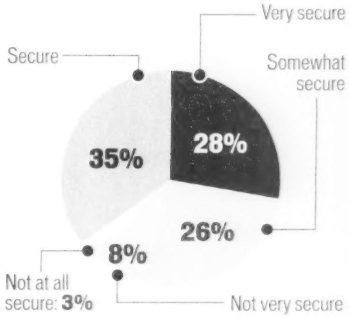

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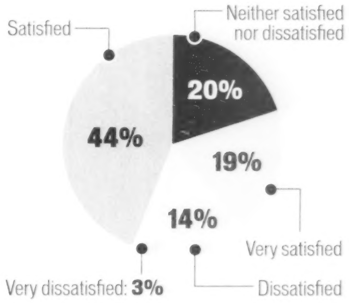

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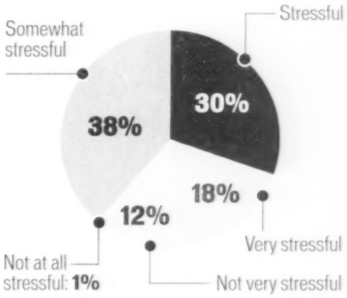

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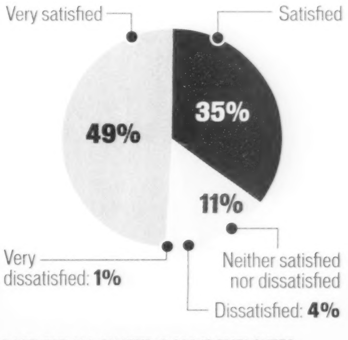

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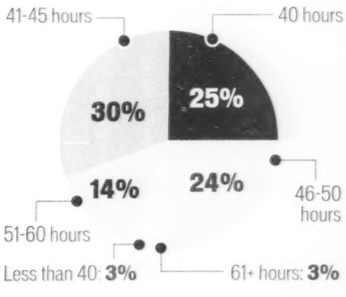

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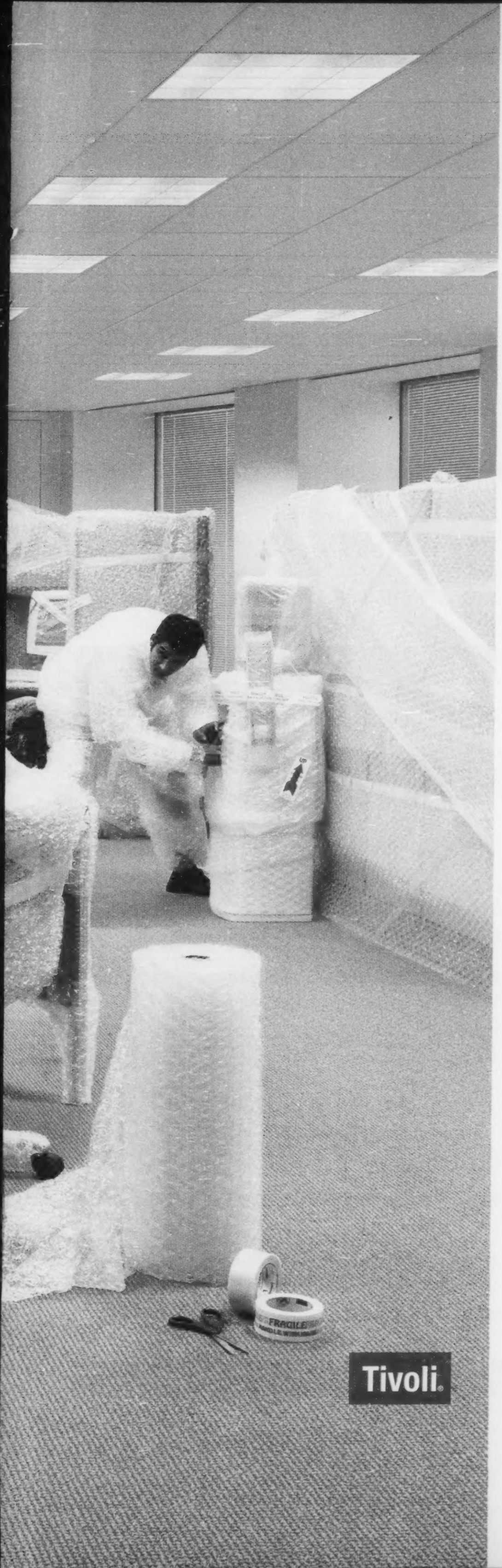
[1] Source: "Business Continuity Unwrapped," Continuity Central, 2006, www.continuitycentral.com/feature0358.htm. IBM, the IBM logo, System p, Take Back Control and Tivoli are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries. ©2007 IBM Corporation. All rights reserved.



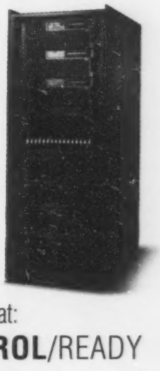
_INFRASTRUCTURE LOG

_DAY 82: There are so many risks out there. So many things that can happen to our business: natural disasters, spikes in traffic, mergers. How do we prepare? One in three companies don't recover from unplanned downtime.[1] Would we?

_Gil has wrapped everything in the office with bubble wrap. Everything. Just to be safe.

_DAY 83: I'm preparing with IBM Business Resilience Solutions. IBM Business Continuity Services can help us assess our risks and design a proactive plan to deal with them. IBM Tivoli gives us the visibility to diagnose and fix infrastructure problems. And the robust availability features of the IBM System p™ give us maximum uptime. The future feels so much safer now.

_No more bubble wrap. And I have to mail a package. Great.



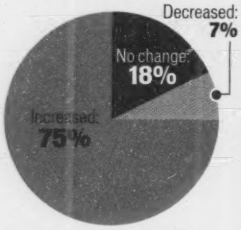
Take the business continuity assessment at:
IBM.COM/**TAKEBACKCONTROL**/READY

21st ANNUAL SALARY SURVEY

SALARIES STEP UP

Across the board, salaries increased slightly in 2007.	3.7%
Senior managers (BASE: 1,406)	4%
Middle managers (BASE: 2,771)	3.7%
IT staffers (BASE: 5,113)	3.6%

How has your base salary changed in the past year?



Average increase: 7%
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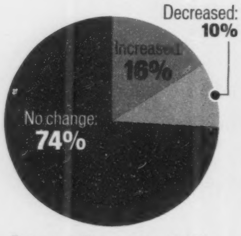
How has your bonus changed, compared with one year ago?



Average increase: 30%
Average decrease: 40%

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2007 TOTAL	2006 TOTAL	PERCENTAGE INCREASE
SENIOR MANAGEMENT POSITIONS					
CIO/vice president of IT	$147,825	$31,411	$179,236	$171,784	4.3%
Chief technology officer	$134,033	$18,971	$153,004	$144,880	5.6%
Chief security officer	$126,402	$17,298	$143,700	$141,497	1.6%
Director of systems development	$136,532	$23,114	$159,646	$154,017	3.7%
Director of IT operations	$101,421	$9,933	$111,354	$107,075	4%
Internet technology strategist	$108,832	$10,261	$119,093	$114,812	3.7%
MIDDLE MANAGEMENT POSITIONS					
Communications manager	$84,080	$5,177	$89,257	$85,553	4.3%
Database manager/ data warehousing manager	$91,868	$6,311	$98,179	$94,959	3.4%
E-commerce/ Internet manager	$87,024	$5,609	$92,633	$89,589	3.4%
Computer operations manager	$82,743	$5,588	$88,331	$84,966	4%
Help desk/ tech support manager	$69,362	$3,544	$72,906	$70,010	4.1%
Information security manager	$93,387	$10,220	$103,607	$100,233	3.4%
IT manager	$81,614	$6,042	$87,656	$84,193	4.1%
Network manager	$75,922	$3,413	$79,335	$77,048	3%
Product manager	$92,623	$8,653	$101,276	$94,999	6.6%
Application development manager	$98,739	$6,545	$105,284	$102,151	3.1%
Project manager	$93,251	$6,945	$100,196	$97,519	2.7%
STAFF AND ENTRY-LEVEL POSITIONS					
Business intelligence analyst	$76,609	$4,083	$80,692	$77,670	3.9%

STAFF AND ENTRY-LEVEL POSITIONS

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2007 TOTAL	2006 TOTAL	PERCENTAGE INCREASE
Database administrator	$80,827	$2,942	$83,769	$81,141	3.2%
Database architect	$102,461	$6,069	$108,530	$105,699	2.7%
Database developer/ modeler	$77,263	$5,769	$83,032	$81,469	1.9%
Help desk/ tech support specialist	$46,526	$1,118	$47,644	$45,725	4.2%
Information security specialist	$78,357	$3,936	$82,293	$79,225	3.9%
Technology/ business analyst	$69,406	$3,115	$72,521	$70,113	3.4%
Network engineer/ wireless network engineer	$74,318	$3,739	$78,056	$74,607	4.6%
Network administrator	$56,008	$1,201	$57,209	$54,992	4%
Programmer/ analyst	$68,865	$2,679	$71,544	$68,867	3.9%
Project leader	$83,646	$7,222	$90,868	$88,173	3.1%
Software developer	$75,163	$3,906	$79,069	$75,619	4.6%
Software engineer	$85,315	$4,455	$89,770	$86,989	3.2%
Systems administrator	$65,590	$1,776	$67,366	$64,998	3.6%
Systems architect	$98,270	$9,573	$107,843	$104,901	2.8%
Systems programmer	$81,752	$2,821	$84,573	$83,059	1.8%
Systems analyst	$64,756	$2,171	$66,927	$64,155	4.3%
Senior systems analyst	$82,831	$3,654	$86,485	$84,003	3%
Technician	$46,757	$1,411	$48,168	$46,342	3.9%
Quality assurance specialist	$66,321	$3,030	$69,351	$67,482	2.8%
Storage administrator/ architect	$84,939	$5,510	$90,449	$87,335	3.6%
Technical trainer	$56,746	$2,213	$58,959	$57,414	2.7%
Web developer	$65,080	$1,764	$66,844	$63,840	4.7%
Webmaster	$54,995	$772	$55,767	$54,339	2.6%

BIGGEST WINNERS

Titles that saw higher-than-average gains in total compensation:

Product manager	6.6%
Chief technology officer	5.6%
Vice president of IT/IS	4.7%
Web developer	4.7%
Network engineer/wireless network engineer	4.6%
Software developer	4.6%
Systems analyst	4.3%

BIGGEST LOSERS

Titles that saw lower-than-average gains in total compensation:

Chief security officer	1.6%
Systems programmer	1.8%
Database developer/ modeler	1.9%
Webmaster	2.6%
Database architect	2.7%
Technical trainer	2.7%
Project manager	2.7%

HOT INDUSTRIES

Largest increases in total compensation, by industry:

Automotive	5.2%
Hospitality/travel	4.6%
Mining/agriculture/ construction/engineering	4.5%
Wholesale trade	4.5%
Finance/accounting	4.4%
Defense/aerospace	4.3%
Entertainment/marketing/ advertising	4.3%

COLD INDUSTRIES

Smallest increases in total compensation, by industry:

Biotechnology/biomedical/ pharmaceutical	1.2%
Transportation/logistics	2.1%
Food/beverages	2.8%
Telecommunications	2.9%
Computer dealer/reseller	3.2%
Manufacturing (computer-related)	3.3%
Legal/insurance/ real estate	3.4%

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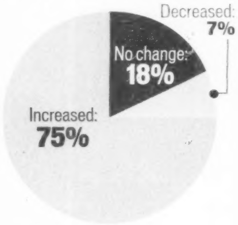

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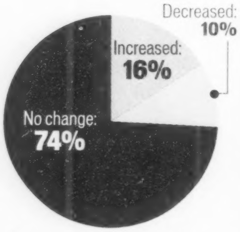
How has your bonus changed, compared with one year ago?



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MIDDLE MANAGEMENT POSITIONS

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2007 TOTAL		PERCENTAGE INCREASE
Communications manager	$84,080	$5,177	$89,257	$85,553	4.3%
Database manager/ data warehousing manager	$91,868	$6,311	$98,179	$94,959	3.4%
E-commerce/ Internet manager	$87,024	$5,609	$92,633	$89,589	3.4%
Computer operations manager	$82,743	$5,588	$88,331	$84,966	4%
Help desk/ tech support manager	$69,362	$3,544	$72,906	$70,010	4.1%
Information security manager	$93,387	$10,220	$103,607	$100,233	3.4%
IT manager	$81,614	$6,042	$87,656	$84,193	4.1%
Network manager	$75,922	$3,413	$79,335	$77,048	3%
Product manager	$92,623	$8,653	$101,276	$94,999	6.6%
Application development manager	$98,739	$6,545	$105,284	$102,151	3.1%
Project manager	$93,251	$6,945	$100,196	$97,519	2.7%

STAFF AND ENTRY-LEVEL POSITIONS

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	2007 TOTAL		PERCENTAGE INCREASE
Business intelligence analyst	$76,609	$4,083	$80,692	$77,670	3.9%

STAFF AND ENTRY-LEVEL POSITIONS

JOB TITLE	AVERAGE SALARY	AVERAGE BONUS	[illegible] TOTAL		PERCENTAGE INCREASE
Database administrator	$80,827	$2,942	$83,769	$81,141	3.2%
Database architect	$102,461	$6,069	$108,530	$105,699	2.7%
Database developer/ modeler	$77,263	$5,769	$83,032	$81,469	1.9%
Help desk/ tech support specialist	$46,526	$1,118	$47,644	$45,725	4.2%
Information security specialist	$78,357	$3,936	$82,293	$79,225	3.9%
Technology/ business analyst	$69,406	$3,115	$72,521	$70,113	3.4%
Network engineer/ wireless network engineer	$74,318	$3,739	$78,056	$74,607	4.6%
Network administrator	$56,008	$1,201	$57,209	$54,992	4%
Programmer/ analyst	$68,865	$2,679	$71,544	$68,867	3.9%
Project leader	$83,646	$7,222	$90,868	$88,173	3.1%
Software developer	$75,163	$3,906	$79,069	$75,619	4.6%
Software engineer	$85,315	$4,455	$89,770	$86,989	3.2%
Systems administrator	$65,590	$1,776	$67,366	$64,998	3.6%
Systems architect	$98,270	$9,573	$107,843	$104,901	2.8%
Systems programmer	$81,752	$2,821	$84,573	$83,059	1.8%
Systems analyst	$64,756	$2,171	$66,927	$64,155	4.3%
Senior systems analyst	$82,831	$3,654	$86,485	$84,003	3%
Technician	$46,757	$1,411	$48,168	$46,342	3.9%
Quality assurance specialist	$66,321	$3,030	$69,351	$67,482	2.8%
Storage administrator/ architect	$84,939	$5,510	$90,449	$87,335	3.6%
Technical trainer	$56,746	$2,213	$58,959	$57,414	2.7%
Web developer	$65,080	$1,764	$66,844	$63,840	4.7%
Webmaster	$54,995	$772	$55,767	$54,339	2.6%

BIGGEST WINNERS

Titles that saw higher-than-average gains in total compensation:

Product manager	6.6%
Chief technology officer	5.6%
Vice president of IT/IS	4.7%
Web developer	4.7%
Network engineer/wireless network engineer	4.6%
Software developer	4.6%
Systems analyst	4.3%

BIGGEST LOSERS

Titles that saw lower-than-average gains in total compensation:

Chief security officer	1.6%
Systems programmer	1.8%
Database developer/ modeler	1.9%
Webmaster	2.6%
Database architect	2.7%
Technical trainer	2.7%
Project manager	2.7%

HOT INDUSTRIES

Largest increases in total compensation, by industry:

Automotive	5.2%
Hospitality/travel	4.6%
Mining/agriculture/ construction/engineering	4.5%
Wholesale trade	4.5%
Finance/accounting	4.4%
Defense/aerospace	4.3%
Entertainment/marketing/ advertising	4.3%

COLD INDUSTRIES

Smallest increases in total compensation, by industry:

Biotechnology/biomedical/ pharmaceutical	1.2%
Transportation/logistics	2.1%
Food/beverages	2.8%
Telecommunications	2.9%
Computer dealer/reseller	3.2%
Manufacturing (computer-related)	3.3%
Legal/insurance/ real estate	3.4%

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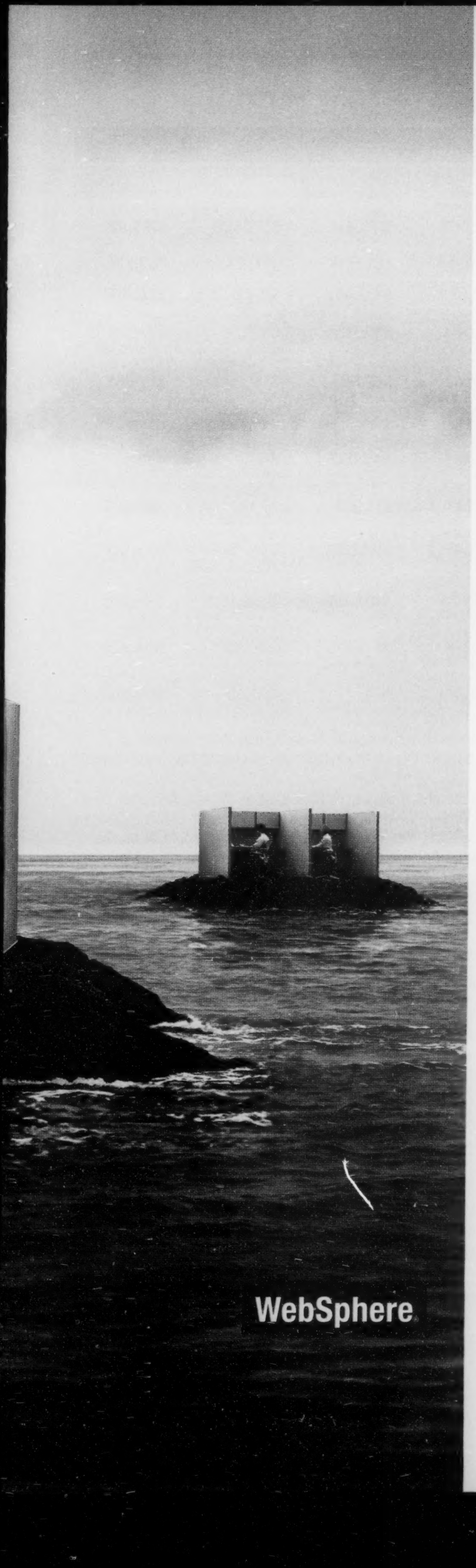

_INFRASTRUCTURE LOG

_DAY 84: Feeling really disconnected. We're not getting the most out of our existing assets. Service and application integration is a nightmare. Our connections are restrictive. We've got to stop working on these islands.

_Please rescue me from this lack of connectivity.

_DAY 87: I've taken back control with IBM WebSphere solutions. Now we can service-enable and connect our existing assets for mission-critical goals. We can reuse existing applications and save money by eliminating redundant systems. Now we're ready for any SOA integration project.

_Plus, no more jellyfish stings.

Download the enterprise service bus white paper at:
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A SAMPLING OF AVERAGE TOTAL COMPENSATION BY REGION

Job title	New England	Middle Atlantic	South Atlantic	North Central	South Central	Mountain	Pacific
CIO/vice president of IT	$156,937	$209,415	$167,353	$172,960	$170,414	$167,669	$185,821
IT manager	$84,831	$98,660	$88,789	$84,691	$89,076	$77,171	$89,718
Director of IT	$117,292	$121,579	$110,040	$104,989	$103,461	$104,627	$121,503
Systems administrator	$74,932	$72,348	$67,265	$62,944	$62,713	$62,100	$77,576
Software engineer	$89,025	$94,593	$93,975	$86,952	$87,110	$95,843	$97,680
Project manager	$104,293	$108,629	$108,182	$92,287	$88,201	$98,633	$105,090
Help desk/technical support specialist	$46,836	$49,090	$48,679	$45,451	$44,032	$45,722	$53,557
Network administrator	$65,648	$60,089	$57,280	$55,561	$51,983	$51,629	$66,820
Network engineer/ wireless network engineer	$74,797*	$82,889	$79,875	$75,548	$76,068	$80,345	$77,186
Application development manager	$113,685*	$107,020	$103,453	$101,273	$103,096	$102,320	$119,636
Database administrator	$80,285*	$90,861	$92,865	$77,253	$80,475	$89,967	$94,651
Technology/ business analyst	$73,708*	$66,292	$70,692	$74,884	$71,177	$71,628	$79,838

GRAY TEXT: The total base for this job title in this particular region was fewer than 30 responses but more than 15. These figures should be used for comparison only, because they don't constitute a statistically significant sampling. *The total base for this job title in this particular region was fewer than 16 responses but more than nine. These figures should be used for comparison only.

REGIONS ARE AS FOLLOWS: **New England:** Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island. **Middle Atlantic:** New York, New Jersey, Pennsylvania. **South Atlantic:** Delaware, District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Puerto Rico, U.S. Virgin Islands. **North Central:** Wisconsin, Michigan, Illinois, Indiana, Ohio, North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri. **South Central:** Kentucky, Tennessee, Mississippi, Alabama, Oklahoma, Arkansas, Louisiana, Texas. **Mountain:** Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico. **Pacific:** Alaska, Washington, Oregon, California, Hawaii, Guam

WHERE DO YOU LIVE?

The median base salary for IT workers varies widely by region:

Pacific	$89,000
New England	$84,750
Middle Atlantic	$84,000
South Atlantic	$84,000
Mountain	$80,000
North Central	$76,000
South Central	$75,000

WORKING FOR A LIVING

What matters most to you about your job?

Base pay	71%
Benefits	53%
Vacation time/paid time off	43%
Flexible work schedule/ telecommuting/working at home	35%
Challenge of job/responsibility	33%
Job stability	28%
Potential for career advancement and development	27%
Skills development/educational and training opportunities	24%
Job atmosphere/community	22%
My opinion and knowledge is valued	18%
Bonus opportunities	17%
Financial stability of company	14%
Recognition for work well done	13%
Commute distance/location	13%
Corporate culture and values	12%
Having the resources to do my job well	12%
Working with leading-edge technology	10%
Working with highly talented peers	9%
Effectiveness of immediate supervision	7%
Corporate commitment to and understanding of the importance of IT	7%
Stock options	5%
How my work helps achieve company goals	5%
Company reputation	4%
Other	1%

NOTE: MULTIPLE RESPONSES ALLOWED.

A SAMPLING OF AVERAGE TOTAL COMPENSATION BY INDUSTRY

CIO/vice president of IT	IT manager	Systems administrator	Application development manager	Software engineer	Help desk/technical support specialist
Banking **$145,941**	Manufacturing (noncomputer) **$86,675**	Services/consulting (computer) **$68,662**	Services/consulting (computer) **$108,601**	Services/consulting (computer) **$87,928**	Services/consulting (computer) **$53,002**
Finance/accounting **$178,269**	Education **$67,365**	Education **$59,627**	Health care **$101,888**	Manufacturing (computer) **$109,372**	Education **$39,989**
Manufacturing (noncomputer) **$224,730**	Government **$76,134**	Manufacturing (noncomputer) **$63,202**	Manufacturing (noncomputer) **$111,877**	Defense/aerospace **$85,740**	Health care **$45,715**
Services/consulting (computer) **$194,979**	Legal/insurance/real estate **$103,165**	Government **$67,998**	Government **$86,857**	Telecommunications **$93,854**	Manufacturing (noncomputer) **$44,167**
Health care **$173,684**	Services/consulting (computer) **$97,169**	Health care **$70,351**	Manufacturing (computer) **$122,682**	Legal/insurance/real estate **$86,425**	Government **$50,835**
Education **$149,553**	Health care **$83,215**	Legal/insurance/real estate **$68,317**	Finance/accounting **$115,647***	Health care **$86,325**	Legal/insurance/real estate **$53,113**
Legal/insurance/real estate **$187,688**	Banking **$97,092**	Telecommunications **$67,354**	Education **$83,208***	Manufacturing (noncomputer) **$73,562**	Finance/accounting **$44,028**

A SAMPLING OF AVERAGE TOTAL COMPENSATION BY INDUSTRY

Director of IT	Senior systems analyst	Systems analyst	Network engineer/wireless	Network administrator	Database administrator
Education **$79,627**	Services/consulting (computer) **$87,288**	Education **$58,363**	Services/consulting (computer) **$76,413**	Manufacturing (noncomputer-related) **$56,225**	Government **$76,662**
Health care **$104,673**	Manufacturing (noncomputer-related) **$85,527**	Government **$68,337**	Telecommunications **$84,503**	Government **$61,817**	Services/consulting (computer) **$91,336**
Manufacturing (noncomputer-related) **$125,524**	Government **$84,508**	Health care **$56,209**	Government **$72,022**	Education **$49,614**	Legal/insurance/real estate **$86,721**
Legal/insurance/real estate **$118,474**	Health care **$77,539**	Services/consulting (computer) **$71,755**	Health care **$73,355**	Health care **$53,596**	Education **$65,602**
Government **$92,907**	Banking **$92,314**	Legal/insurance/real estate **$74,015**	Education **$63,013**	Services/consulting (computer) **$59,638**	Finance/accounting **$95,979***
Services/consulting (computer) **$131,129**	Energy/utilities **$87,557**	Finance/accounting **$78,071***	Manufacturing (noncomputer-related) **$71,600**	Banking **$49,771**	Health care **$78,618***
Entertainment/advertising **$111,687**	Legal/insurance/real estate **$75,014***	Defense/aerospace **$73,925***	Manufacturing (computer-related) **$92,106***	Finance/accounting **$63,194**	Manufacturing (noncomputer-related) **$84,171***

GRAY TEXT: The total base for this job title in this particular industry was fewer than 30 responses but more than 15. These figures should be used for comparison only, because they don't constitute a statistically significant sampling. *****The total base for this job title in this particular industry was fewer than 16 responses but more than nine. These figures should be used for comparison only.

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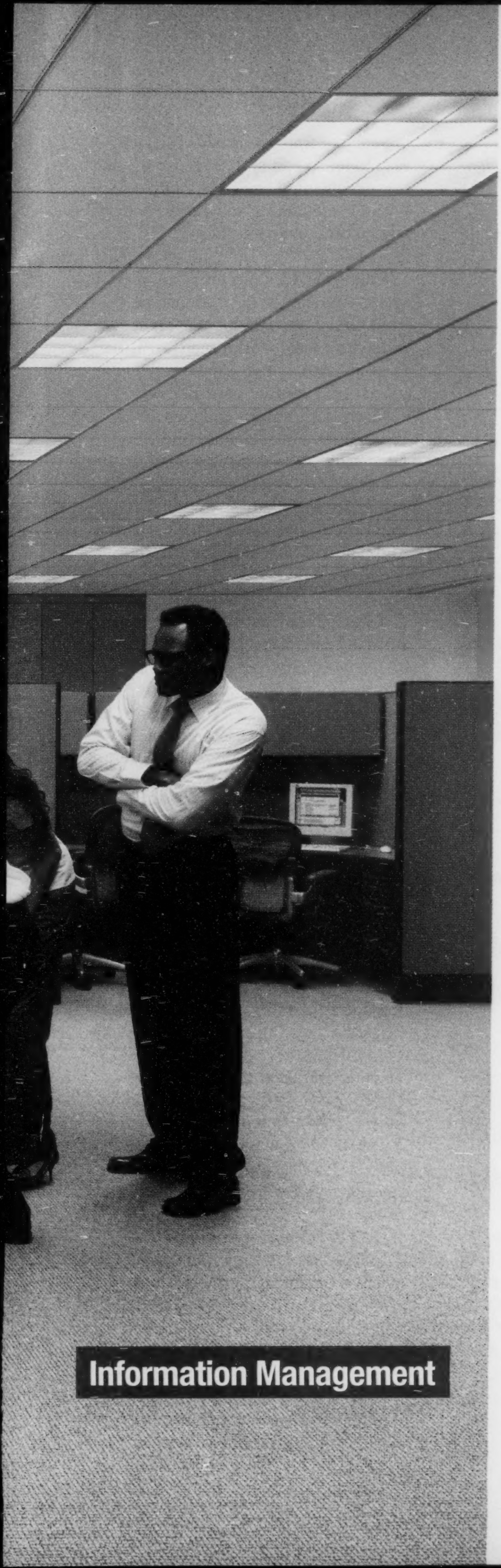

_INFRASTRUCTURE LOG

_DAY 69: All we need is one specific piece of info. Gil almost had it, but his hand cramped. How are we supposed to find trusted business info when these massive volumes of disparate, conflicting information keep pouring in?

_Gil just grabbed a stuffed panda.

_DAY 71: The answer: IBM solutions for leveraging information. Now we can cleanse info and standardize source data fields for consistency and accuracy. I can create a single, comprehensive and accurate record of info across our source systems. Finally, I can provide a unified, trusted view of our information so everyone can make better decisions.

_Our view of our data is now scalable. Just in time — I think we ran out of quarters.

Download the Innovation and Competitive Advantage white paper:
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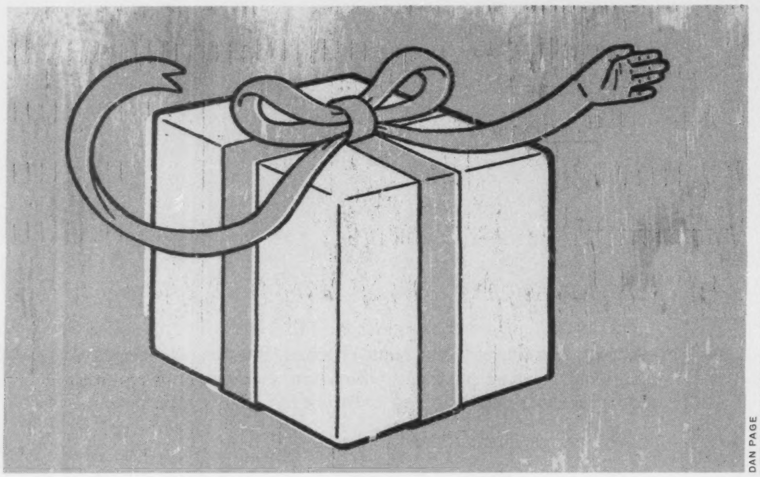


DAN PAGE

Are You THE Complete Package?

Nine nontechie skills that hiring managers wish you had (and how to get them).

BY THOMAS HOFFMAN

WHEN it comes to technical skills, you either have them or you get them. This year's hiring survey shows that there's demand for a broad range of skills, many of which have been hot for several years (see charts, next page). But what else makes for a great IT hire? In their continual struggle to align IT with the business, IT executives say they're increasingly looking for staffers who have, in addition to technical chops, solid business acumen and so-called soft skills, like strong communication and listening abilities.

Computerworld's most recent hiring and skills survey confirms that. Survey respondents said writing and public speaking are two of the most important soft skills they look for when hiring new employees.

Classes that teach technical skills are easy to find, but what's the best way to learn soft skills? Here's a look at nine skills employers are looking for, with IT executives and career experts' advice on how to get them.

1. Writing ability. Communication skills are a requisite for IT workers, says Tom Casey, senior vice president and architect of the workforce transformation practice at BSG Concours, a Kingwood, Texas-based consultancy.

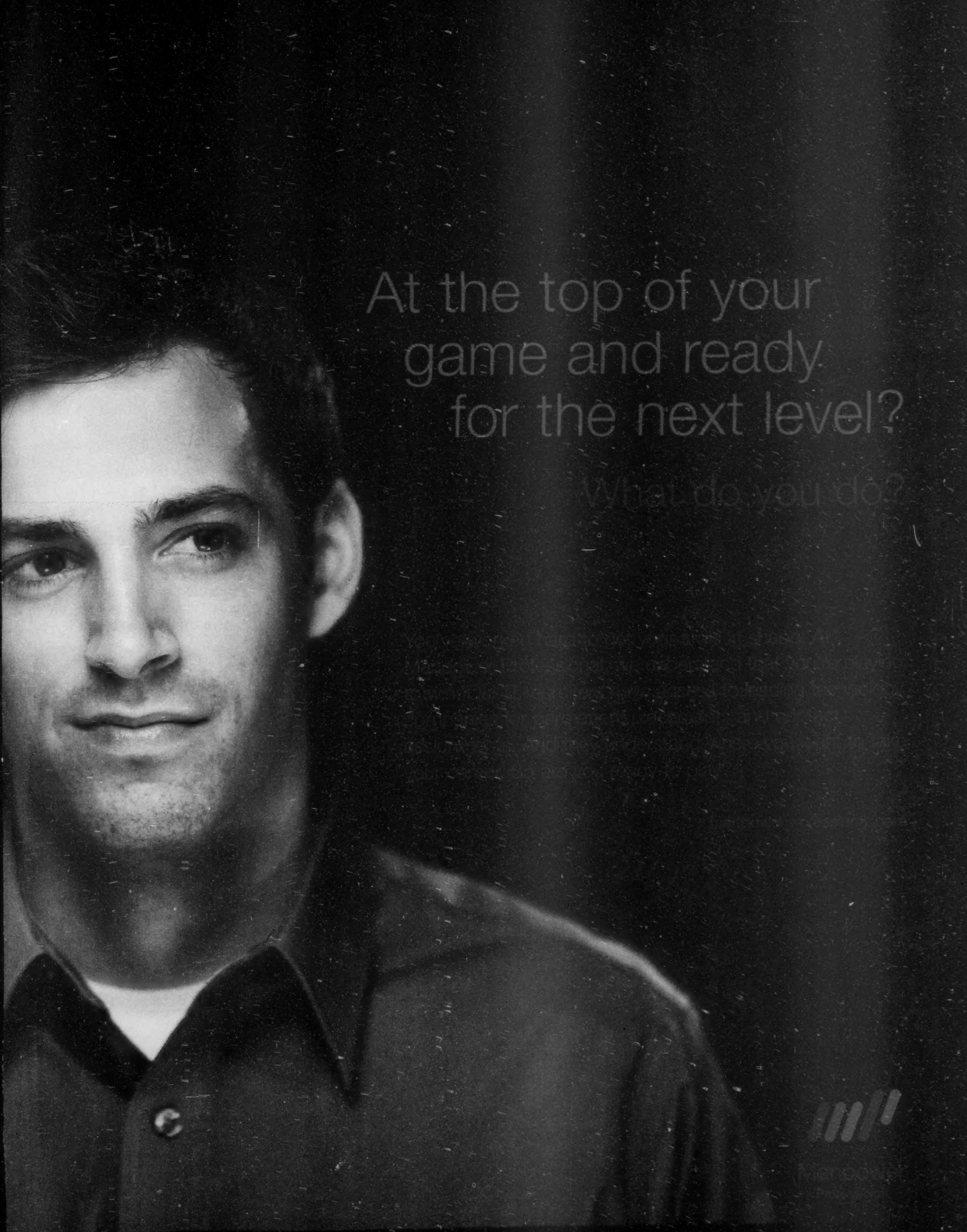
Many community colleges and online universities offer continuing education courses on business writing, says Robert Keefe, incoming president of the Society for Information Management (SIM) and senior vice president and CIO at Mueller Water Products Inc. in Atlanta.

2. An understanding of business-process mapping and tools. "If there's one group in the company that needs to excel at process mapping, it's the IT group," says John Roulat, vice president of IT at Carl Zeiss Inc., a Thornwood, N.Y.-based medical technology manufacturer. Although flowcharts can be used, swim charts, which offer a visual depiction of how business processes flow across functional areas, are very effective, he says. Roulat says there are "books galore" on the subject, but he recommends bringing in consultants to train IT workers on how to use swim charts.

3. An aptitude for public speaking. They may be a throwback to the 1960s, but Toastmasters International clubs can help IT workers refine their public speaking skills and get past their jitters. Also, SIM's Regional Leadership Forum can help up-and-coming IT professionals polish their leadership skills, including their speaking ability, says Keefe.

4. An understanding of accounting. Universities, training firms and even professional organizations such as Omicron, an Atlanta-based consortium of IT associations, offer courses in accounting and financial principles. Alternatively, in-house financial experts from a company's accounting or finance department can offer tutorials to IT professionals, says Roulat.

Continued on page 50


At the top of your game and ready for the next level?
What do you do?

Continued from page 48

These skills are a great start, but most IT managers want to see even more in their potential hires. Hiring managers say they also look for attributes like entrepreneurism, intellectual curiosity and traits like these:

5. The ability to work well with a team. "Anyone can muscle their way through an already overburdened IT group," says Roulat. But a person who is able to gain consensus and sell an idea "not only gets the job done, but makes the group stronger," he adds. Still, it's not easy identifying and finding people with these traits. "You have to see how they do in the field," he says.

6. Initiative. "Being a small [IT] shop, I like to hire people who have demonstrated they can deliver without constant oversight," says David Dart, regional head of IT at HSH Nordbank AG in New York, where he oversees a 10-person staff. Dart says his management style is to create a vision or a goal and allow his staff to "make it happen without too much supervision."

7. An inquisitive mind. IT professionals "need to be able to learn on their own" and acquire needed skills through a variety of venues, including online classes, blogs and networking sites, says Roni Krisavage, vice president of IT at World Wrestling Entertainment Inc. in Stamford, Conn.

8. The ability to get a point across. IT professionals should possess not only an ability to speak to business people in terms they understand, but also strong writing skills and a talent for conversing with people who are in a variety of roles, says Didi Raizen, IT applications manager at Flatiron Construction Corp. in Longmont, Colo. While these types of skills can be developed, some people are just natural-born communicators, notes Raizen.

She encountered people like that at a previous job she had as manager of globalization software at J.D. Edwards & Co. There, a team of business analysts and nontechnical workers she oversaw "blew me away with the recommendations they came up with to solve problems on a low-scale budget," says Raizen. "Those types of folks are difficult to find."

9. A willingness to take risks. "I believe the modern IT person is more of an IT entrepreneur," since he is constantly looking to improve upon existing ways of doing things or identify other business and operational opportunities, says Roulat. He notes how the increasing use of Web-based applications and open architectures is providing opportunities for IT organizations to present approaches that are affordable, quick to implement and disposable.

The bottom line, says Roulat, is to "keep your eyes open, take a risk, learn from it, and move on." ■

METHODOLOGY

Computerworld's 21st Annual Salary Survey was administered via the Internet. Responses from both *Computerworld* print subscribers and visitors to *Computerworld.com* were included in the survey results.

The collection of survey data began May 14, 2007, and concluded July 20. A total of 9,998 people responded to the survey. Of those respondents, 9,290 were employed full or part time and were eligible to complete the entire survey.

At the 95% confidence level, the margin of error for this sample size is less than +/-1 percentage point. Compensation figures for 2006 were calculated based on the percentage change reported by the respondents.

WHO THEY ARE

Eighty-three percent of respondents were men, 92% were employed full time, and 46% said a bachelor's degree was their highest level of education. Respondents had worked an average of 15 years in IT, and their average age was 43. The companies they work for employ an average of 9,682 total employees and an average of 1,044 IT staffers. The average 2007 revenue of their employers is $2.9 billion. Thirty-nine percent work for public companies, while 36% work for private companies, 10% work in government, 8% at nonprofits, and 7% in education.

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MORE ONLINE
For a detailed look at how we conducted this survey, visit our Web site: **computerworld.com/07/salaries**

21st
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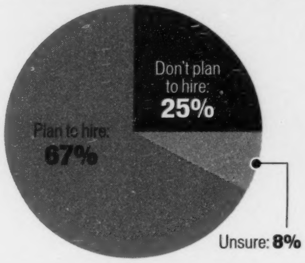
SURVEY

HIRING FORECAST

More than two-thirds of the respondents said they expect their companies to hire new IT staffers within the next 12 months.



At employers that plan on hiring new IT staffers, an average of 85% of new recruits will be from outside the company.

SKILLS MOST WANTED

The technology areas where respondents said they are experiencing the greatest skills shortages:

Application development	34%
Database analysis and development	19%
Security	15%
Web design and development	15%
Help desk and IT support	15%
Business intelligence	14%

NOTE: MULTIPLE RESPONSES ALLOWED.

TECH APPEAL

97% of respondents reported that their IT organizations are seeking certain technical qualifications. Here are the areas of IT expertise that were most frequently cited as being in demand:

SQL Server	46%
Network technician	44%
Microsoft .Net Framework	39%
Java	30%
XML	29%
Oracle database and applications	25%

NOTE: MULTIPLE RESPONSES ALLOWED.

SOURCE: COMPUTERWORLD HIRING & SKILLS SURVEY, JULY 2007; 204 RESPONSES

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NETWORK MANAGER
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Juniper NETWORKS

"Hey Larry, are you getting the feeling our users might be a tad frustrated with application performance since we consolidated data centers?"

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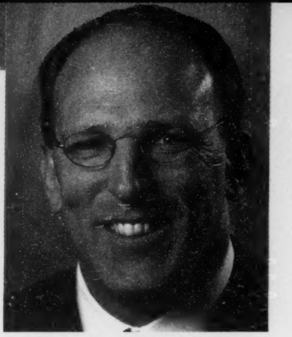
Jim Lanzalotto



Get the Job You Want

RESULTS FROM *Computerworld's* recent jobs survey and the Q3 results from the Yoh Index of Technology Wages are a must-read for anyone in the IT industry. The surveys show some common trends, in both salary and hiring data.

Armed with this information, how can employees get the jobs they want and employers get the workers they want? Here are some action items for both camps.

FOR EMPLOYEES

Consultants can cash in. *Computerworld* found that salaries increased 3.7% across the board this year for permanent staffers. Consultants fared even better, as wages rose an average of 5.5% for the quarter that ended Sept. 30, compared with the same period last year, according to the Q3 2007 Yoh Index of Technology Wages. Rising rates for both permanent employees and consultants indicate strong demand and short supply, signaling good hiring prospects for IT workers.

If you find you're not happy with your earnings, consider your options. Look into becoming a consultant — the work is out there, and the pay is better. Or, talk to your manager about getting that raise you deserve. It's important for you to establish your value proposition to the company. By ensuring that you're achieving the tasks assigned to you, you can continue to highlight the reasons you're important and indispensable to your employer.

Reach for the right skills. Application development is the most sought-after discipline and is also where the industry is experiencing the greatest shortage in talent, according to *Computerworld's* research. This lines up with the Yoh Index, which finds that demand is strongest for Java and .Net skills. However, if waiting for bits to compile isn't your cup of tea (or bottle of Jolt), fret not. The Yoh Index finds equally strong demand for SAP functional and technical gurus, business intelligence experts and project managers.

Ensure that your skill certifications are up to date. Not only will this make you a desirable candidate for hire during a job search, but after you're hired, enhancing your skills can give you added leverage in asking for that raise. Ensuring that you have the right certifications can help build your career profile, not only in your own company, but also throughout the industry, and it can help you to develop future business relationships.

FOR EMPLOYERS

Flex those hiring muscles. Forty-two percent of *Computerworld's* respondents cited difficulty recruiting workers as a top hiring concern. If you're concerned about finding top talent, broaden definitions about company needs, job roles, functions and the attributes of your ideal candidate. The narrower your definitions, the harder it is to find a fit.

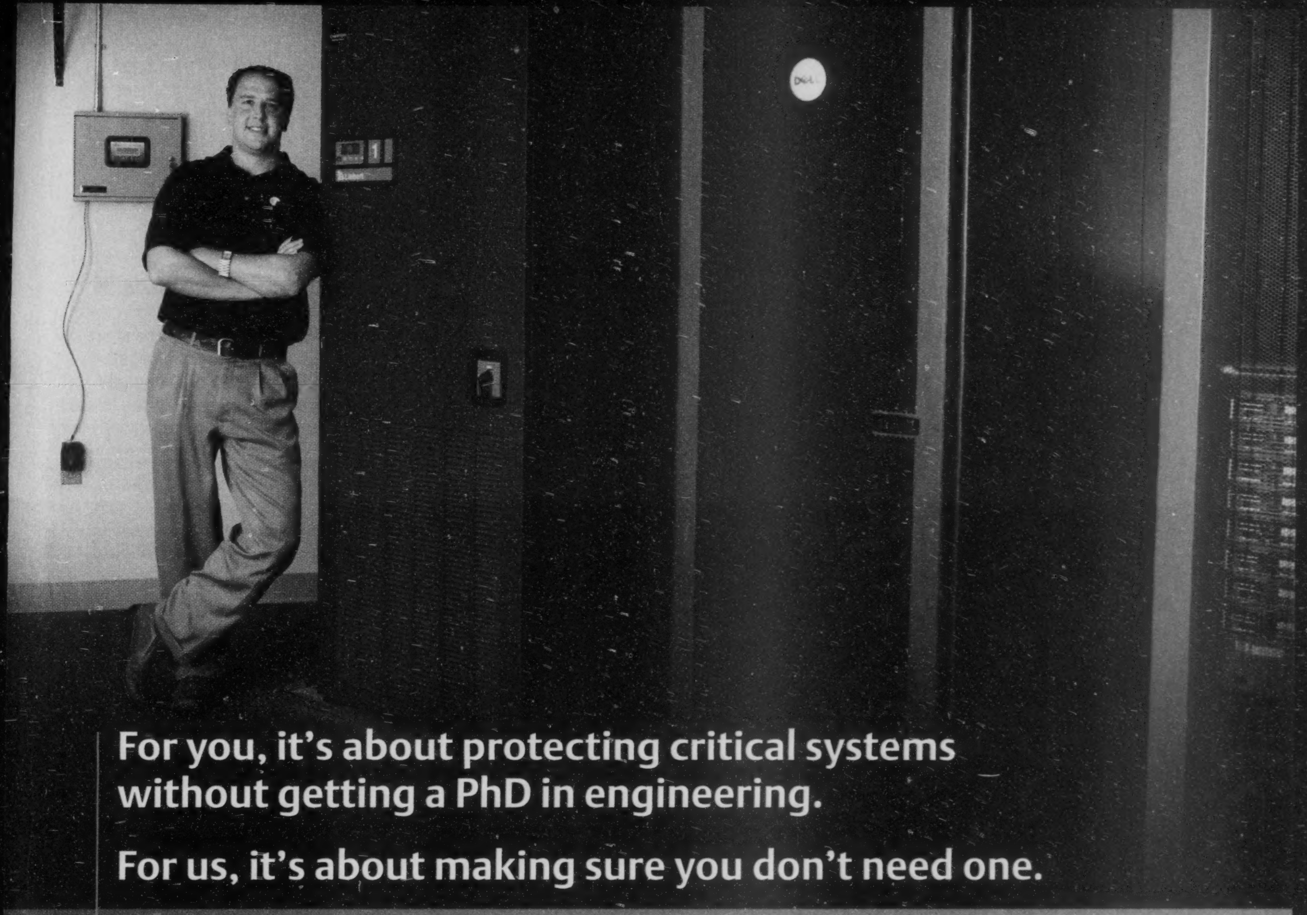
Instead, look for complementary experience, and provide the necessary training to get people up to speed after they're hired. Smart IT people learn fast — and the chance to obtain new certifications can be leveraged as a perk to attract more applicants.

Also, investigate partnering with a staffing agency. The best agencies have a deep roster of talented contractors who can fill gaps in the short term while you work to fill positions for the long term.

Give your budget a reality check. The majority of *Computerworld's* respondents (53%) said that tight hiring budgets were their biggest concern. But with the talent pool tight, in-demand skills (Java, .Net and SAP NetWeaver expertise in particular, according to the Yoh Index) will cost a premium.

This is also an area where partnering with a national recruiting firm can help. It will have a nationwide talent database on tap and will often find the right skills at the right salary, right away. A recruiter can also help you plan your budgets for the next year by providing you with the most updated data on wages, talent demand and potential growth. The Yoh Index of Technology Wages can provide additional insight in this area as well. ■

Jim Lanzalotto *is vice president of strategy and marketing at Yoh* (www.yoh.com)*, a unit of Day & Zimmermann.*



For you, it's about protecting critical systems without getting a PhD in engineering.

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WOMEN IN IT:

A Lopsided Pay Scale

Men continue to make more than women for the same IT jobs. **BY THOMAS HOFFMAN**

ACCORDING TO *Computerworld's* annual Salary Survey, male IT professionals continue to outearn their female counterparts. At the highest level of IT, male CIOs and vice presidents made on average $179,026 in total compensation this year, while women in the same jobs took in nearly $6,000 less, at $173,052. The pay differences between middle managers and technical workers are similarly unequal (see charts at right).

This salary inequity between men and women in IT is a longstanding issue, but it could have short-term consequences for companies that pay female IT workers less, according to Umesh Ramakrishnan, vice chairman of CTPartners, an executive recruiter in New York.

"The pay package is what it is for the best executive," regardless of gender, says Ramakrishnan. "It's a rather shortsighted view if you're paying a female executive less. You're not going to hold onto that person very long."

Ramakrishnan says while he hasn't seen a difference in compensation packages between the male and female IT executives he has helped place, he has seen pay inequities between men and women in lower levels of the IT organization. In many workplaces, the inequity is the result of longstanding differences in pay that have yet to be corrected, he says.

For women who feel that they are underpaid, Ramakrishnan offers this advice: Find out what your peers are earning at similar companies, and present your findings to a supervisor or human resources representative to illustrate your market value. "It lets the company know you're thinking about it, and it lets them know whether you're well paid or underpaid," he says.

Karen Piper, a business intelligence analyst at Ball Corp., a Broomfield, Colo.-based maker of food and beverage containers, says she believes that the salary gap between men and women has narrowed in recent years. But she doesn't think the IT landscape is necessarily a level playing field.

"Men don't have to work as hard as women to get promoted," says Piper, a 20-year IT veteran. Female IT workers "have to go above and beyond" to advance, she says.

Others aren't sure there's a correlation between gender and pay. Didi Raizen, an IT applications manager at Flatiron Construction Corp. in Longmont, Colo., says she doesn't think she earns less than her male peers at other companies. "Women have demonstrated their value in the IT realm," she says.

Tammy Wicks, a business applications analyst at FedEx Freight Corp. in San Jose, says she, too, is unsure whether there's salary inequity between men and women in IT. But she says she does know this: "My salary still outweighs my husband's." ■

21st ANNUAL SALARY SURVEY

SALARIES FOR WOMEN UP 3.5%

Female IT workers got the short end of the salary stick again in 2007, bested by their male counterparts in pay across the board:

AVERAGE 2007 TOTAL COMPENSATION	
Male IT workers	$91,460
UP 3.8% FROM LAST YEAR	
Female IT workers	$83,510
UP 3.5% FROM LAST YEAR	

BONUSES FOR WOMEN UP 2.4%

The news for women is even worse on the bonus front:

AVERAGE 2007 BONUS	
Male IT workers	$6,958
UP 3.6% FROM LAST YEAR	
Female IT workers	$5,121
UP 2.4% FROM LAST YEAR	

BASE: 7,677 MEN; 1,538 WOMEN

SAME JOB, DIFFERENT PAY

A sampling of common titles and the earning power of men vs. women:

Vice president of IT/CIO	
Male (BASE: 338)	$179,026
Female (BASE: 54)	$173,052
IT managers	
Male (BASE: 795)	$88,571
Female (BASE: 140)	$83,451
Directors of IT	
Male (BASE: 623)	$113,292
Female (BASE: 69)	$97,215
Project managers	
Male (BASE: 361)	$100,762
Female (BASE: 113)	$96,815
Help desk managers	
Male (BASE: 97)	$73,713
Female (BASE: 24)	$69,845
Programmer/analysts	
Male (BASE: 339)	$71,548
Female (BASE: 75)	$70,654

SOURCE: COMPUTERWORLD SALARY SURVEY
BASE: 9,290 IT EMPLOYEES

For all stories go to www.microsoft.com/reliable

Microsoft

The Highly Reliable Times

VOLUME 1 – ISSUE 5

Windows Server 2003

SWISS SEES RELIABILITY SOAR WITH WINDOWS SERVER, CHECKS RED HAT AT GATE

Tom Nagy for The Highly Reliable Times

THE SWISS INTERNATIONAL AIR LINES hub, located in Zurich, Switzerland.

> *"Windows Server has given us the reliability to grow our online services and differentiate ourselves from the competition. With Linux, we didn't get the reliability or flexibility we needed."*
>
> *–Frank Meyer, CIO, SWISS*

Global Airline's Migration Yields 99.95% Reliability

By MICHAEL BETTENDORF

ZURICH—Swiss International Air Lines (SWISS), Switzerland's national airline, serves 70 destinations around the world with 6,500 employees in 105 branch offices. Today, 14% of SWISS's total ticket sales are processed through its online flight booking system at Swiss.com, with volume increasing by 30% per year. 24x7 operations are critical for this site because of its importance to the airline's business, but the original Red Hat Linux–based booking system was not meeting SWISS's requirements. So the airline began its search for a more reliable platform.

Reliability also drives market perception in the airline industry, according to SWISS CIO Frank Meyer. "In our business, having a plane in the maintenance hangar is not good for our image. It is the same for our online service—people expect it to be up and running," says Meyer.

After an intensive evaluation, Meyer and his team chose Windows Server® 2003 and .NET. Since migrating the online booking system to Windows Server, SWISS has seen reliability rise to 99.95%. In addition, while the previous Red Hat Linux–based system could only handle 250 concurrent users, the new system can now handle significantly more traffic than that. Meyer is confident about the effect of these changes: "Moving uptime to 99.95% while increasing performance to handle a greater number of users enables our team to easily handle the 30% growth we are seeing in our online sales."

For the full SWISS story, plus other case studies and independent research findings on the reliability of Windows Server versus Linux, visit microsoft.com/reliable

STUDY: Side effects of reliability can include smiling, calmness

A study released today shows significant mood improvement in IT executives such as Frank Meyer (left) when they experience Windows Server reliability.

– Continued on Page B3

Speedy Hires

A little prep work helps speed IT hiring to fill growing talent gaps.

BY THOMAS HOFFMAN

WHY IS IT TAKING longer than ever to find — and land — IT professionals with the right stuff? In *Computerworld*'s most recent hiring survey, more than two-thirds of the respondents said they expect their companies to be bringing on new IT staffers within the next 12 months, and 88% said their employers were experiencing a skills shortage.

The demand is there, but where are the candidates? In *Computerworld*'s companion salary survey, only 9% of IT workers polled said that they're actively looking for a job, and 63% reported feeling secure or very secure in their current position.

Experts say another part of the problem is that hiring managers are increasingly looking to unearth IT professionals with precise skills to meet specific needs, such as SAP Business Warehouse experts with experience in the pharmaceutical industry.

Even when candidates are available, a lack of preparation by hiring managers or a disconnect between IT and human resources can slow the process.

"Interviewing is tough, especially if you haven't done a great deal of preparation," says Tom Nodar, vice president of the project management office at Axis Insurance, a specialty insurer in Alpharetta, Ga.

Before the first interview is conducted, hiring managers should assess the needed skills, develop a thorough job specification, conduct market research, and determine salary ranges and flexibility around compensation, says Nodar.

"All of this cannot just be dumped on HR," says Nodar. He suggests blocking out a half-day for applicant interviews, followed by a collaboration session with HR and other managers.

It also helps to quickly determine whether an applicant's personality is a fit. John Roulat, vice president of IT at Carl Zeiss Inc., a medical technology manufacturer in Thornwood, N.Y., says that in one case, he asked senior SAP analysts he was interviewing to describe situations in which they demonstrated key personality characteristics that the company was seeking in applicants for the posted job.

Since the SAP analysts would be on the front lines of business development and support and working directly with internal customers, Roulat says he thought it was important for candidates to meet those personality requirements.

Using an outside recruiter can also slow down the hiring process. While it's not always possible to find and recruit IT workers directly, using a recruitment firm "tends to add a tremendous amount of latency," says David Dart, regional head of IT at HSH-Nordbank AG in New York.

Dart says that when he uses recruitment firms, he often ends up interviewing a number of candidates or reviewing résumés for people "who are not appropriate." So whenever possible, he tries to recruit and hire people who are introduced to him through personal recommendations. That, he says, "cuts out the middleman." ■

21st ANNUAL SALARY SURVEY

MONEY MATTERS

Which factors would most influence you to change your job?

Salary increase	84%
Better work/life balance	47%
More vacation time	39%
Large sign-on bonus	38%
Access to new technology projects	36%
More responsibility	32%
More training	28%
New title	17%
Complete career change	17%
Relocation	16%
Paid moving expenses	16%

MULTIPLE RESPONSES ALLOWED.

CONTENT TO STAY

Top four reasons why IT workers aren't looking for jobs:

1	Satisfied with current job responsibilities	69%
2	Satisfied with company culture	51%
3	Satisfied with current compensation	50%
4	Job market is poor/ few opportunities	18%

BASE: 4,246 RESPONDENTS; MULTIPLE RESPONSES ALLOWED.

FREE TIME AT A PREMIUM

The top six perks or benefits IT professionals wish their companies offered:

Additional time off/sabbaticals	43%
Telecommuting option	39%
Comp time	28%
Profit sharing	26%
Company car	19%
Flexible scheduling	19%

MULTIPLE RESPONSES ALLOWED.

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Tech FOR Teens

Camps use cool gadgetry to attract middle-schoolers to future tech careers.

BY THOMAS HOFFMAN

FACED WITH dwindling enrollments in university computer science and IT programs, the Society for Information Management has taken a novel approach to engaging America's youth in potential IT careers: It is partnering with public libraries and other organizations to create technology camps for teenagers.

The first such summer camp, which Chicago-based SIM organized three years ago with the Memphis Public Library, "connects SIM to the next generation of technology users," says Terrice Thomas, who works at the Memphis Public Library & Information Center.

The weeklong Teen Tech Camps, which target 12-to-15-year-olds, give kids a chance to learn about BSOs — "big, shiny objects" such as iPhones, digital cameras and other gadgets — says John Oglesby, director of IT strategy at Memphis-based ACH Food Cos. and former president of the Memphis SIM chapter.

The gadget sessions, conducted by employees of SIM Memphis member companies, are intended to appeal to teen campers while teaching them how technology can be applied in a work environment. For instance, one instructor demonstrated how tablet PCs can be used in hospitals, "and that surprised some of the kids," Thomas says.

The high-tech gadgets also benefit the library's staffers, who are learning about emerging technologies and receiving training on the devices used at the camp, she says.

» The Memphis Public Library's Teen Tech Camps aim to highlight IT as a career option.

The Memphis camps, which have drawn 12 to 18 teenagers per session, require applicants to obtain a referral letter from a teacher and to write a short essay to gauge their interest in the program, according to John Lloyd, the business and sciences librarian.

The first session was so popular that "we've had kids try to sneak into the camp" each of the past two years, says Betty Anne Wilson, assistant director for library advancement.

This past summer, campers produced their own webcasts.

Officials from SIM's Memphis chapter and the Memphis Public Library worked closely to develop the camp program. "One of the reasons it worked so well is that John [Oglesby] and I talked a lot about the missions of both organizations," Wilson says. The library has "a lot of experience with teens and had done a lot of programs with them," she adds.

EXPANSION PLANS

SIM officials are so enthusiastic about the Memphis camp that they're "trying to find ways to incorporate this into other SIM chapters," says Stephen Pickett, chairman of the SIM Foundation and vice president and CIO at Penske Corp. in Bloomfield Hills, Mich.

For instance, SIM has created a set of software templates from the Memphis project that other SIM chapters can use to develop their own Teen Tech Camps with libraries and other community organizations. The software, which includes a budget template, marketing timelines and permission forms, will be available for download from SIM's home page in the near future, Pickett says.

SIM's Philadelphia chapter has launched a similar program, starting with a school system and more recently partnering with a nonprofit organization, he says.

"We're actively working on selling this" to other chapters, Pickett says. "We're hoping to have 29 more [camps] up and running next year." ■

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Tech Campuses Bustle With Recruiters

Recent computer science grads get higher salaries, but midcareer IT workers may face perils. **BY PATRICK THIBODEAU**

COMPUTER SCIENCE graduates and others with IT skills appear to be in demand: Starting salary offers are up, according to a recent report, and university officials say IT recruiters are crowding campuses.

But if you're a high-tech worker in the middle of your career, the job outlook may be less certain, as cutbacks continue at some of the top IT vendors.

Recruiters "are on college campuses constantly looking for people," says Emanuel Contomanolis, associate vice president of co-op and career services at the Rochester Institute of Technology (RIT) in New York. And it isn't just vendors doing the recruiting, he says, pointing to rising interest in tech grads among certain vertical industries.

For instance, Contomanolis says financial services firms, which typically had been focusing their college hiring efforts on students with financial-related degrees, are now aggressively hiring graduates with IT skills. That's because the companies have realized that technology capabilities "are going to be critical to how they differentiate themselves in the market," he adds.

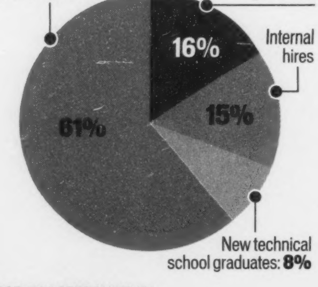
The heightened interest is evident in survey data collected by the National Association of Colleges and Employers (NACE), which reported in September that computer science graduates have been offered an average salary of $53,051 this year, up 4.5% from last year's level. Contomanolis is president-elect of Bethlehem, Pa.-based NACE, which also says that those graduating with MIS degrees this year have received an average starting salary offer of $47,407, up 4.7% year to year.

The salaries being offered to computer science graduates from the class of 2007 are the highest reported to NACE in the past seven years. The next-highest salary level was recorded in 2001, when graduates were offered $52,4703 on average.

The fact that recruiters now have a smaller pool of computer science students to choose from may be contributing to the increased salary offers. For instance, according to the Computing Research Association (CRA) in Washington, the 170 institutions in North America that grant computer science degrees up to the Ph.D. level reported a total of 10,206 bachelor's degree graduates for the academic year that ended in the spring of 2006 — the most recent one for which data is available. That was down by nearly one-third from the level at the start of this decade.

LOCATING TALENT

More than two-thirds of respondents said they expect their companies to be hiring new IT staffers within the next 12 months. Where will they find these new recruits?



SOURCE: COMPUTERWORLD HIRING & SKILLS SURVEY, JULY 2007

BASE: 204 RESPONDENTS

"The drop isn't over yet," says Jay Vegso, a CRA staff member who authored a March 2007 report on the declining number of computer science graduates. Vegso has also been looking at enrollment trends, and he says he expects the decline in computer science graduates to continue for another two years — or perhaps stabilize at best.

The most-cited reason for the decline is the dot-com bust; the students who graduated last spring would have enrolled when the high-tech downturn was at about its worst point. But the movement of tech jobs to lower-wage countries is also seen as a factor.

Kelly Bishop, executive director of career services at Michigan State University in East Lansing, says the interest in recent graduates is driven largely by concern about the looming retirements of baby boomers. But he adds that although employers seem to be urgently searching for new workers, companies also "are going to a lot of lengths to identify a relatively short list of people they consider are going to make a difference in their organization."

Prospective employers "are all eager to talk to you, but it's still going to be tough to get a job," Bishop says. "They are being incredibly selective."

For many established workers, the picture is less pretty than it is for new graduates. For instance, Electronic Data Systems Corp. said in a filing to the U.S. Securities and Exchange Commission last month that it was offering an early retirement program to about 12,000 of its 50,000 U.S. workers.

Such actions indicate that "midcareer workers better beware," says Ron Hira, an assistant professor of public policy at RIT and co-author of the book *Outsourcing America* (American Management Association, 2005).

"The same firms that are laying off thousands are clamoring that they need more foreign workers," Hira says. "One interpretation of this phenomenon is that companies have no interest in retraining or retaining incumbent workers to fill those positions." ■

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JOBS REPORT 2007 | OPINION

Katherine Spencer Lee

Turn the Uptick To Your Advantage

IT'S BEEN a good year for IT workers. *Computerworld*'s annual salary survey shows IT pay is on the upswing, and, equally encouraging, salaries are expected to continue to climb in 2008. The just-released Robert Half Technology 2008 Salary Guide indicates that the average base salary for all IT roles will rise 5.3% next year.

What's behind the positive outlook? Simply put, the IT industry continues to thrive despite some signs of economic uncertainty in recent months. In a September 2007 poll by *CIO.com*, 58% of IT executives said they weren't concerned about the current credit crunch affecting their budgets, and only 12% indicated that they plan to change or eliminate projects as a result of it.

In fact, ongoing business growth and renewed technology investments are driving demand for IT workers to the highest levels in several years. Companies are recognizing that technology investments are essential to their ability to compete. Initiatives in security, applications and Web development, wireless communication, database management and other sectors are fueling a robust market for skilled IT professionals. According to the Bureau of Labor Statistics' most recent projections — from 2004 — nearly 1 million “computer specialist” jobs will be created by 2014.

Though there's strong need for skilled IT workers across the board — from the standpoint of both the development of new technologies and the support of existing ones — some positions are expected to be in even greater demand in 2008. For example, according to Robert Half Technology, positions such as lead applications developer, messaging administrator and data modeler should see increases in base compensation of 7% or more next year compared with 2007.

Computerworld's findings bear out these bright employment prospects. According to the survey, application development skills are in greatest demand by hiring managers. The most marketable lead developers oversee development teams and apply technical know-how to everyday business challenges. Messaging administrators are in high demand as companies aim to keep their employees, clients and customers connected via e-mail systems, corporate networks and mobile devices. And data modelers are needed to organize data into logical models and ensure access to reporting functionality.

IT'S MOST WANTED

What does all this mean for your career? First and foremost, it means you have a significant advantage in the job market. You may be hesitant to test the waters if you have a secure position, but keep in mind that it's not easy for many businesses to find the people they need. Forty-two percent of hiring managers in *Computerworld*'s survey said difficulty in recruiting workers is their top hiring concern.

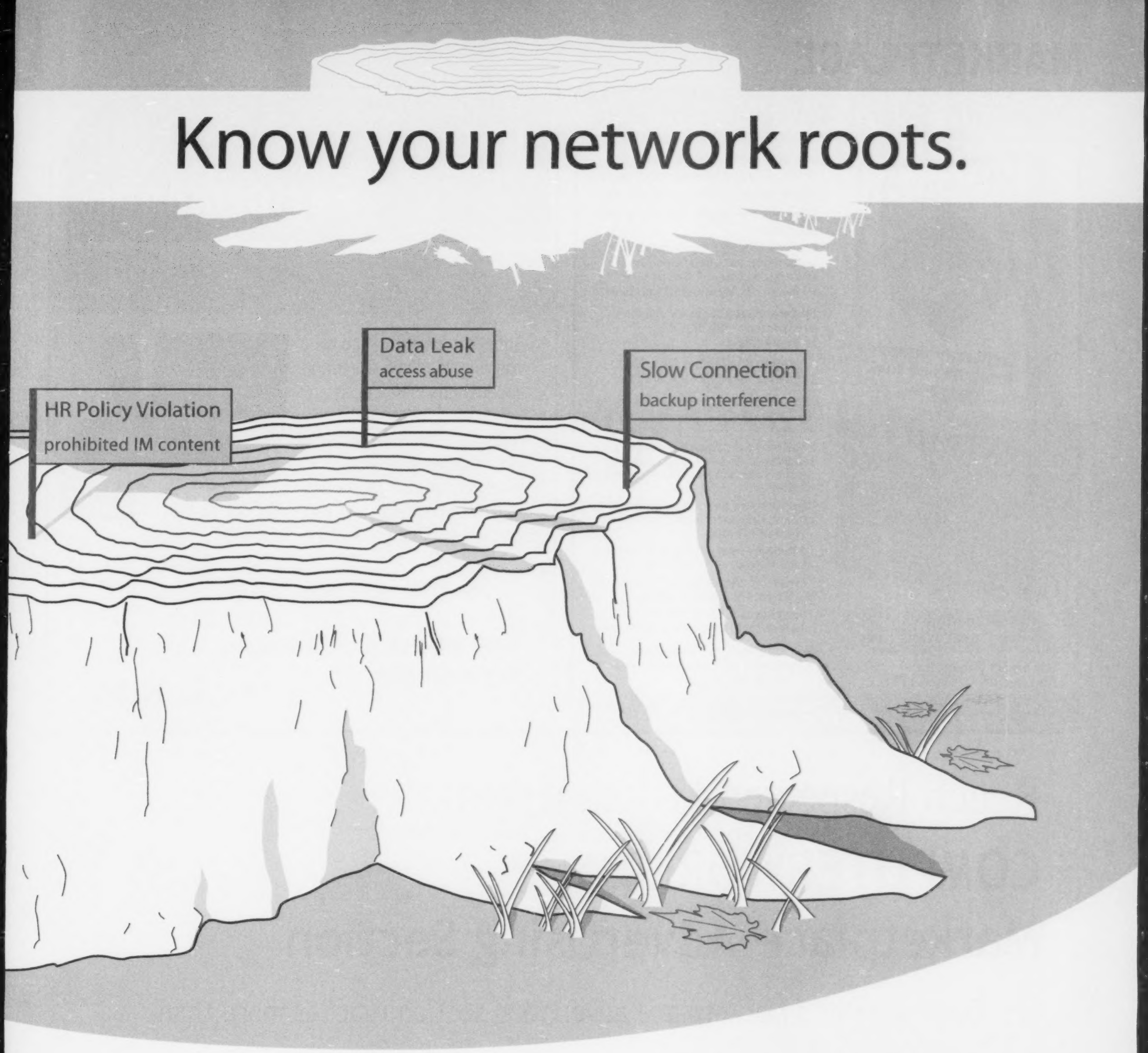
More employers than you realize may be seeking the skills you possess. If you have been considering asking your boss for a raise, the results from these surveys might assist your efforts. Naturally, there are many factors to consider, but the competitive marketplace, as indicated by results like these, is one piece of the puzzle that you and your employer should take into consideration.

If your company isn't in a position to increase your base salary, perhaps your boss would be open to an alternative, such as a larger bonus, a stock grant, or even a nonmonetary perk like a flexible work schedule or extra time off.

Vary your search to increase your chance of success. Robert Half Technology's research shows that companies are relying less on online job boards and classified ads, and more on networking and referrals in the hiring process. If you're spending the bulk of your job search online, attend industry events and schedule informational interviews in an effort to expand your network.

Also remember that hiring managers seek individuals who are able to tie a firm's technical capabilities to its business needs. As a result, your soft skills are important. Your project management, communication and problem-solving abilities can increase your marketability and serve as a deciding factor if an employer is evaluating another candidate with qualifications similar to yours. ■

Katherine Spencer Lee *is executive director of Robert Half Technology* (www.rht.com)*, a provider of IT professionals on a project and full-time basis.*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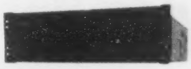

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■ **Candy bars**	**19%**
■ **Cigarettes**	**10%**

SOURCE: WORKPLACE MEDIA INC. SURVEY OF 1,200 U.S. EMPLOYEES, FEBRUARY 2007; MULTIPLE RESPONSES ALLOWED.

Golden Years

Because the populations of many countries are aging, Manpower Inc. last year asked over 28,000 employers in 24 nations and Hong Kong whether they had developed strategies to recruit older workers and retain them past retirement age.

PERCENTAGE RECRUITING OLDER WORKERS:	
Singapore (No. 1)	**48%**
U.S. (tied for No. 5)	**18%**
Sweden (No. 25)	**4%**

PERCENTAGE WITH STRATEGIES FOR RETAINING OLDER WORKERS:	
Japan (No. 1)	**83%**
U.S. (tied for No. 5)	**28%**
Italy and Spain (tied for No. 24)	**6%**

In Need of a 12-Step Program?

Statistics Canada recently examined workaholics' lifestyles. In an August report titled "Time Escapes Me: Workaholics and Time Perception," Leslie-Anne Keown, an analyst at the government agency, wrote that workaholics "are very dissatisfied with their work/life balance and wish they could spend more time with family and friends." Are riches and glamorous lifestyles their rewards for giving those things up? No, they're less happy with life in general and are not more gratified by their finances or their jobs than nonworkaholics. In fact, there is very little socioeconomic difference between workaholics and other workers. The study of workers age 19 to 64 was based on the 2005 General Social Survey by Statistics Canada.

59%

Percentage of workaholics who are male.

SOURCE: STATISTICS CANADA

PAGE COMPILED BY JAMIE ECKLE.

Business Meets Academia

>>> HOW U.S. COLLEGES AND UNIVERSITIES ARE WORKING WITH THE PRIVATE SECTOR TO DEVELOP NEXT-GENERATION IT LEADERS

■ **School:** University of Denver Daniels College of Business

■ **Does it have an IT advisory council?** No, but IT and e-business executives serve as guest lecturers a few times a month within the college's Department of Information Technology and Electronic Commerce, says Hans Hultgren, a senior lecturer who directs the school's data warehousing and business intelligence program.

■ **IT executive feedback that has helped amend the curriculum:** "I think the most relevant example is our curriculum advisory board for the MS-BI [master's in business intelligence] program we're launching this fall," says Hultgren. BI experts such as Claudia Imhoff and Bill Inmon, both of whom live in the Denver area, serve on the MS-BI advisory board and were among the board members who helped develop the curriculum. "We do a lot with the local business community," says Hultgren.

■ **Number of graduate degrees in IT awarded in spring 2007:** Four

In designing its new MS-BI program, the Daniels College of Business worked closely with the business community. The focus of the program reflects that input.

"People in BI are typically oriented to one or two tools," says Hultgren. "We put less emphasis on that and more on project management, business analysis, understanding workflows, and soft skills to help glean requirements from different parts of the organization."

About 20 students are enrolled for the first term of the 12-month program, which has just gotten under way this fall. "As we get further into it, we can envision several dozen students each time," says Hultgren.

The MS-BI program include internships. "We have what we call the BI Community Connection, deploying the students to work in teams on projects that are under way," says Hultgren. One such project, within the Denver-based Center for Tax Policy, involves building a data warehouse that can be used to mine, analyze, aggregate and integrate data across disparate systems.

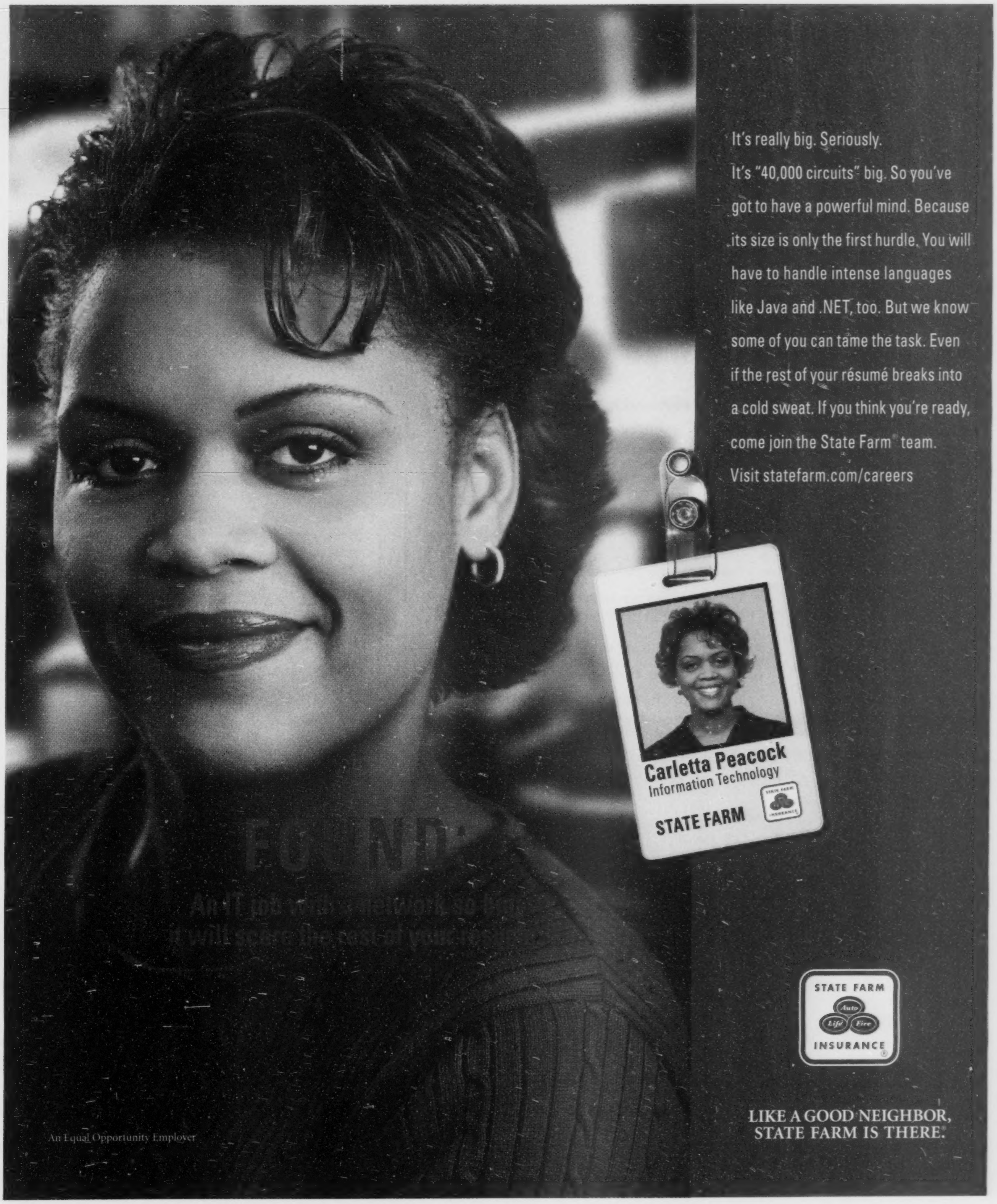
– THOMAS HOFFMAN

The Value of a Degree

Average pay for selected job titles, by educational level and years of experience.		BACHELOR'S DEGREE	MASTER'S DEGREE
Computer hardware engineer	5-9 years	$84,200	$95,300
	10-19 years*		
Database administrator	5-9 years	$73,700	$85,000
	10-19 years	$84,500	$91,000
Network administrator	5-9 years	$52,500	$59,000
	10-19 years	$56,500	$62,300
IT project manager	5-9 years	$85,000	$90,000
	10-19 years	$96,000	$101,000
Software developer	5-9 years	$73,500	$79,500
	10-19 years	$82,000	$90,500
Quality assurance engineer	5-9 years	$70,000	$77,200
	10-19 years	$72,800	$88,800

SOURCE: PAYSCALE INC.'S ONLINE DATABASE OF EMPLOYEE SALARY DATA

* Insufficient data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Application Development:

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TRUE TALES OF IT LIFE AS TOLD TO SHARKY

What Could Go Wrong?

Pilot fish takes a new job as an IT business process manager. "One of the first things I noticed was that we have no process for escalation and communication paths if our incident management system goes down," says fish. "Since this happened my first week on the job, it became a pressing issue." Fish calls a meeting of everyone who needs to be involved in drafting the procedure. That includes fish's predecessor, who was promoted out of the job – and starts the meeting by asking why they're discussing something so obvious: "If the incident management system goes down, then the service desk should create a new incident in the system and route it to the appropriate people," he says. Sighs fish, "I'm embarrassed to say how long it took this person to realize why this solution was not an option."

Aha!

User calls the help desk saying his printer has "a small leak." "He said it had been going on for a while now, but he just never got around to calling anyone," says the pilot fish who takes the call. "When I went to look at the printer, I was amazed. The ink was not leaking onto the paper at all; it was coming out the sides of the case. Turns out the printer had been leaking for over a year – it had leaked about two inches of ink into the bottom of the case. After I explained to the user what was happening, he said, 'I was wondering why I had to change the ink so often.' "

One Thing at a Time

It's years ago – "in the days of DP, not IT," says a pilot fish on the scene – and this computer room has a night-shift computer operator who does everything by the book. Literally. "One night on our mainframe, he got an error that caused the processor to stop," fish says. "He called me, the programmer on call that night, and I asked him to read the message, which he did. In an effort to do some training, I asked him what the message meant. He replied in a very straight and stoic manner, 'You asked me to read it, not understand it.' "

But Now They Know

Telecommuting pilot fish receives this e-mail from work: "There is no power to [the office where fish works] at this time. Employees may go home. Please call in four hours to check for further status." Says fish, "I called my manager to ask if I could go home – joking, since I was already there. The manager and the other employees at the office had never received the e-mail. Why? The power was out, of course. . . ."

■ *Shark Tank never shuts down — it's powered by true tales of IT life. Send yours to me at sharky@computerworld.com, and I'll send you a stylish Shark shirt if I use it.*

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■ COMPANIES IN THIS ISSUE

Page number refers to page on which story begins. Company names can also be searched at computerworld.com

Acer Inc. 72
ACH Food Cos. 58
Advanced Micro Devices Inc. 72
Alabanza Corp. 12
American Academy of Family Physicians 20
American Management Association 60
Apple Inc. 30, 72
Asustek Computer Inc. 72
AT&T Inc. 72
Axis Insurance 56
Ball Corp. 37, 54
Beijing Organizing Committee 16
Blue Cross and Blue Shield Association 20
BSG Concours 48
Bureau of Labor Statistics 62
California Department of Corrections and Rehabilitation 33
Capstone Services 14
Carl Zeiss Inc. 48, 56
Carnegie Mellon University 14
CaSa Customer Solutions LLC 14
Center for Tax Policy 66
Centers for Medicare & Medicaid Services 20
Challenger, Gray & Christmas Inc. 14
Cisco Systems Inc. 24
Computing Research Association 60
CTPartners 54
The Day & Zimmermann Group Inc. 52
Dell Inc. 16
DuPont 14
Electronic Data Systems Corp. 60
EMC Corp. 16
Emerging Media Dynamics Inc. 12
Entuity Inc. 24
EqualLogic Inc. 16
Federal Trade Commission 14
FedEx Freight Corp. 36, 54
Flatiron Construction Corp. 36, 50, 54
Forrester Research Inc. 22
Gartner Inc. 6, 22
GE Industrial Systems 14
Gear6 Inc. 24
Geisinger Health System 20
General Electric Co. 14
General Motors Corp. 14
Google Inc. 14, 72
Health Information Management Systems Society 18
Hewlett-Packard Co. 22
HSH Nordbank AG 50, 56
HTC Corp. 72
Intel Corp. 30, 72
Internet Governance Forum 12
JupiterResearch LLC 30
Kurzweil Technologies Inc. 26
L-3 Communications Holdings Inc. 37
LG Electronics Inc. 72
Manpower Inc. 66
McDonald's Corp. 33
MCI Inc. 16
Memphis Public Library 58
Mercer Management Consulting Inc. 33
Michigan State University 60
Microsoft Corp. 14, 16, 22, 30, 72
Motorola Inc. 72
Mueller Water Products Inc. 48
National Association of Colleges and Employers 60
National Highway Traffic Safety Administration 12
NaviSite Inc. 12
Nokia Corp. 72
North Carolina Biotechnology Center 37
NTT DoCoMo Inc. 72
Ohio State University Medical Center 18
Omicron 48
Oracle Corp. 12
Palm Inc. 72
PayScale Inc. 66
Penske Corp. 58
Regis University 37
Research In Motion Ltd. 72
Robert Half Technology 37, 62
Rochester Institute of Technology 60
Saladinos Inc. 36
Salesforce.com Inc. 14
Samsung Electronics Co. 72
SAP AG 52, 56
Society for Information Management 48, 58
Software Engineering Institute 14
Sprint Nextel Corp. 72
Starbucks Corp. 33
Statistics Canada 66
Sun Microsystems Inc. 37
Symbian Ltd. 72
The Internet Corporation for Assigned Names and Numbers 16
Toastmasters International 48
U.S. Department of Defense 14
U.S. Department of Health and Human Services 18
U.S. Department of Transportation 12
U.S. Department of Veterans Affairs 18
U.S. Federal Trade Commission 22
U.S. Marine Corps 16
U.S. Securities and Exchange Commission 60
University of Cincinnati 18
University of Denver 66
Vanco PLC 6
Vanderbilt University 20
Verizon Wireless 72
VMware Inc. 16
Wal-Mart Stores Inc. 72
Whole Foods Market Inc. 22
Wild Oats Markets Inc. 22
Wolf Popper LLP 12
WorkPlace Media Inc. 66
World Wrestling Entertainment Inc. 50
Woven Systems Inc. 24
Yahoo Inc. 22
Yoh Services LLC 52

Accenture 21
American Power Conversion 65
AT&T Wireless 13
BigFix 29
Brocade 7
CA 15
CDW Corporation C2-1
Dell Computer C4
Diskeeper 71
dtSearch 64
Hewlett-Packard 3, 57
IBM 34-35, 38-39, 42-43, 46-47
Intel 11
InterSystems 17
Juniper Networks 51
Kodak 31
Liebert 53
LTO Ultrium 61
LXE 64
Manpower 49
Microsoft Linux 55
NetApp C3
Network Instruments 63
Novell 9
Samsung 5
SAS 59
Sun Microsystems 23, 25
SunGard Availability Services 27
Webroot Software 19

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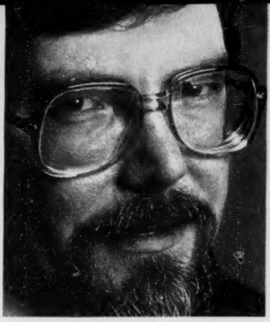
■ FRANKLY SPEAKING

Frank Hayes



Game-Changer

WILL THE GooglePhone matter? Last week, Google officially unveiled its long-rumored mobile phone software. Dubbed "Android," the Linux-based software stack is being backed by more than 30 partners, including handset makers Motorola, Samsung, LG and HTC, and service providers Sprint Nextel, T-Mobile and NTT DoCoMo.

But no Nokia. No AT&T or Verizon. No Apple or Palm. No Symbian, Microsoft or RIM. Without them, will Android matter at all?

Hold that thought.

The day after Google's Android announcement, the One Laptop Per Child Foundation said that its low-cost, Linux-based laptops for kids are finally rolling off the assembly line in China. The little green XO laptops, with their built-in mesh networking and low-power-consumption design, will start shipping to Uruguay and Mongolia shortly.

Two years ago, when MIT's Nicholas Negroponte first started showing prototypes of the XO, nobody in the IT business took it seriously. It was too small for adults to use comfortably, too toylike in appearance, too underpowered to run commercial software. And it was being developed by academics who had never designed a real product, much less sold a single unit. There's just no market for it, the bigwigs said.

Intel boss Craig Barrett went out of his way to sneer at the XO, calling it "the $100 gadget." Of course, Intel rival AMD was supplying the CPUs for the XO. And Intel had its own low-end laptop, the Classmate PC, which it was trying to sell to foreign governments to distribute to students — without much success.

Two years later, the XO's price has ballooned to almost $200. And Negroponte, who circled the globe talking up the XO and getting handshake agreements from governments, has discovered that doesn't often translate into an actual purchase.

■ Can Google's Android make a difference? Sure. Android doesn't even have to win. It just has to be in the game.

But those two years have raised the concept of low-end laptops from an academic fantasy to a marketplace reality.

Today, Intel is selling Classmate PCs by the thousands at about $300 each (its biggest deal is 700,000 in Pakistan), has joined Negroponte's foundation and may use some of the XO's technology in its own products.

Meanwhile, Asustek is now selling an XO-like laptop called the Eee PC in Taiwan for about $250 to consumers. And in the U.S., Wal-Mart has been selling Acer laptops for under $350.

And starting today, U.S. and Canadian consumers can even get an XO — as long as they're willing to pay $399, so a second XO can be shipped to a third-world student.

But before XO has even shipped, it's already a game-changer. That nonexistent market for a low-end laptop for kids? Now it exists.

Funny how competition will do that.

Which brings us back to Google's Android. Let's face it: Google has about as much experience making mobile phones as Negroponte had making laptops in 2005. Sure, Google has money to burn, and it has lined up partnerships with major players in the mobile business — but not the top U.S. players.

Can Android still make a difference? Sure. Android doesn't even have to win. It just has to be in the game.

What does Android promise? Lots of third-party applications and better Web browsing, mainly. That's what Nokia, Apple, Symbian, AT&T and the rest will be scrambling to match in the year before Android-based phones hit the market.

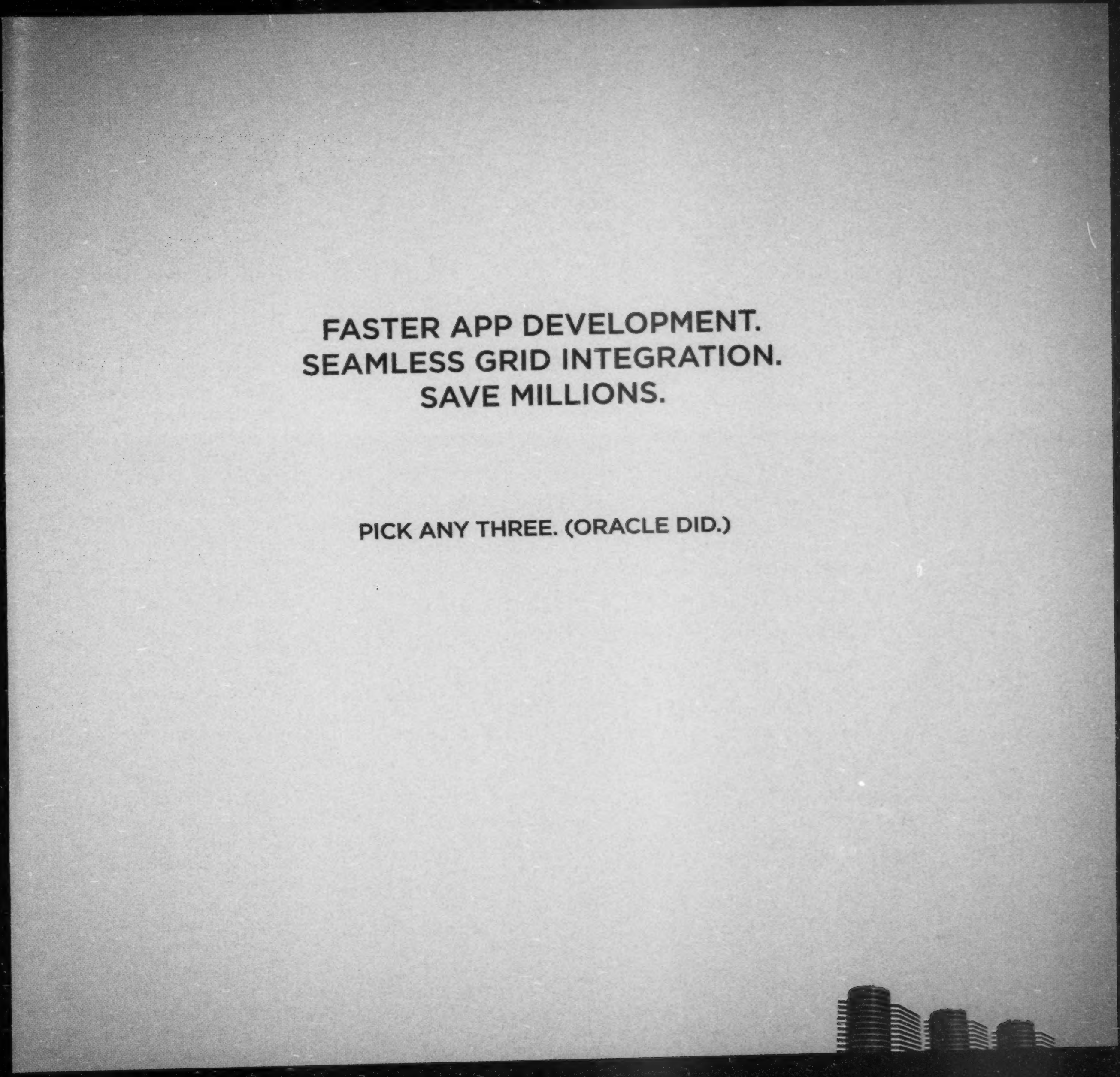
So those new capabilities will be out there anyway. And since Google makes its money from ads on Web pages, the 800-pound gorilla of dot-coms wins even if Android loses.

The rest of us? We get Android's benefits either way, too — easier development, more usable Web apps, the things that can make smart phones better business tools.

All because Google isn't afraid to compete.

And there's nothing the matter with that at all. ■

Frank Hayes *is Computerworld's senior news columnist. Contact him at frank_hayes@computerworld.com.*



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